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PENNSYLVANIA AGRICULTURE AND COUNTRY LIFE

1640-1840

By
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ILLUSTRATIONS BY S. W. FLETCHER, JR.

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Pennsylvania Agriculture and
Country Life

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FOREWORD

During most of the two-century period covered in this survey Pennsylvania led the other colonies and states in the production of food. It was the "bread basket of the nation." Here was laid the foundation of much that is most significant in American agriculture. Farmers dominated the economic and political life of the province and state, partly because of their numerical preponderance. This was made possible not only by fertile soils and efficient farming but also by the substantial character of those who lived on the land.

Whenever possible the story is told in the words of contemporaries, even at the expense of continuity of narrative. Firsthand accounts by those who experienced the circumstance or were eye-witnesses of the scene have an authenticity that a writer of today can only assume.

Many individuals have contributed to the preparation of this book. The author is under special obligation to the late John M. Okie, of Upper Darby, Pennsylvania, former Secretary of the Philadelphia Society for Promoting Agriculture. Mr. W. P. Lewis and Miss Anna Malone of the Library of The Pennsylvania State College have facilitated access to source material; and several colleagues on the faculty of the College have reviewed the manuscript, particularly John B. Dickey.

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S. W. Fletcher

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PENNSYLVANIA AGRICULTURE AND COUNTRY LIFE • 1640-1840

I

THE LAND

FOR MORE than a century, from 1725 until 1840, Pennsylvania was foremost among the colonies and states in the production of food. Her preeminence in agriculture during the formative years of the nation was due not only to the varied agricultural genius of the several nationalities that comprised her population, but also to a rich heritage of land. Pennsylvania was "the bread-basket of the nation" because much of her soil was fertile and because her farmers were traditionally wise in the lore of the land.

A "Goodly Land"

To the adventurous pioneers it semed a "goodly land." William Penn found "the land good, the air clear and sweet, the springs plentiful, and provision good and easy to come at . . . . The fields here are white for the harvest."[1] Penn found cause for satisfaction in native vegetation and wildlife. On the banks of the Delaware he discovered, "black walnut, cedar, cyprus, chestnut, poplar, gum-wood, hickory, sassafras, ash, beech, oaks of divers sorts, as red, white and black. . . . The fruits that I find in the woods are the white and black mulberry, chestnut, walnut, plums, strawberries, cranberries, hurtleberries, and grapes of divers sorts. . . . Here are also peaches very good, and in great quantities, not an Indian plantation without them. . . . For food as well as for profit, the elk as big as a small ox, deer bigger than ours, beaver, raccoons, rabbits, squirrels. . . . Of fowl of the land there is turkey (forty and fifty pounds weight), heath-birds, pigeons and partridges in abundance. . . . The creatures for profit only by skin or fur are the wildcat, panther, otter, wolf, fox, fisher, minx, muskrat."[2]

The most outstanding feature of the province was the almost unbroken forest. Of the 28,828,800 acres which comprise the present land area of Pennsylvania probably more than ninety-eight per cent was covered with forest. "Pennsylvania under natural conditions," says Joseph T. Rothrock, "was one of the best wooded states, if not the very best, in the eastern half of the Union. Not only were her forests dense and her trees large and valuable, but they comprised a variety that were of greater commercial importance than could be found, probably, in any other state." [3] It has been estimated that the virgin forests of Pennsylvania averaged 17,500 board feet of lumber and ten cords of wood per acre.[4]

A Swedish traveler, John David Schoepf, vividly describes a primeval forest: "The forest is so thick that the tree trunks almost touch, by their height and their matted branches making a dimness, cold and fearful, even at noon on the clearest day. All beneath is grown up in green and impenetrable bush. Everywhere lie fallen trees or those half fallen, despite of their weight not reaching the ground. Thousands of rotten and rotting trunks cover the ground, making every step uncertain; and between lies a fat bed of the richest mould that sucks up like a sponge all the moisture. . . . One can with difficulty penetrate this growth even a little way." [5]

In limited areas, however, particularly on the lower reaches of the Delaware, the forest was not a jungle. De Vries, who sailed up that river in 1631, noted that the trees were not close together and that there was little undergrowth. One of the first settlers of Chester County recalled that he "could have driven a horse and cart . . . in almost every direction through the forest without meeting any material obstruction." [6]

There were giant trees in those days. In 1807 John Pearson reported, "In Lycoming County the sugar maple tree is found 4 feet in diameter. . . . In November, 1791, a hollow buttonwood or sycamore, on the south side of the Ohio about 15 miles from Pittsburgh, at 4 feet from the ground was 39 feet around. . . . Either a chestnut or poplar near Peach Bottom ferry on the Susquehanna, was hollow and was 11 feet in diameter within; a school was said to have been kept in it. . . . On Sandy Lick Creek a pine tree which was 12 feet in diameter. . . . In Wayne County are white oaks, white ash and cherry trees 5 feet in diameter. . . . In Lower Chichester, Delaware County, a black oak was felled in 1790 which was 8 feet in diameter."[7]

The forest was both an asset and a liability to the settlers. It supplied building materials and meat. Fur-bearing animals provided clothing and supplemental income. Sugar maple trees supplied sweetening. Eventually the timber had sale value. These assets, however, were partly offset by the prodigious labor required to clear the land. "It is a very fine Country," wrote Thomas Markham to his wife in 1681, "if it were not so overgrown with Woods." The slow and laborious process of clearing land occupied a large part of the time of the settlers for many years. Moreover, the forest sheltered wolves, bear, panthers, foxes and other animals that preyed upon livestock. On the whole, however, the assets of the forest far outweighed the liabilities.

The founder of Pennsylvania realized that the forest of his domain was one of its greatest assets. In his "Charter of Privileges," published on October 28, 1701, he stipulated, "One acre should be left in trees in every five cleared." There is no evidence, however, that this regulation was observed in a single instance.

The settlers quickly adopted the Indian practice of firing the forest to facilitate the killing of game. The first forest fire regulations originated, not in a desire to protect the forest, but to protect farm crops. On December 26, 1676, the Duke of York promulgated this law: "If any Person whatsoever shall kindle any fire in the woods or Grounds lying in common, or his own Grounds, so as the same shall runne into any Corne Grounds or Enclosures of his Neighbors, he shall be Lyable to pay all Damage and costs . . . or, as an alternative, to twenty stripes." [8] Penn confirmed this law, save as to the twenty stripes.

On November 27, 1700, the Provincial Council passed "An Act against Unseasonable Firing of Woods," making it a misdemeanor to set woods on fire between March 1 and January 1; at other times this had legal sanction. These legal forest fires, however, often got out of bounds; so on March 27, 1712, the law was amended to provide that incendiary hunters must give all property owners within a mile of the projected fire at least twenty-four hours notice of their intentions.

Not until March 29, 1735, was there sufficient public sentiment against forest fires to justify the General Assembly in passing a restraining act. No "seasonable time" for setting fire to woods, fields and marshes was recognized in this Act. It remained unchanged until April 18, 1794, when the criminal aspect of firing woods was further emphasized by law.

Hunters, however, continued to devastate the forests. In 1783 Schoepf recorded numerous forest fires in Lehigh and Northampton counties "caused by hunters who post themselves behind the wind and wait for game frightened out by the fire and smoke." [9] In 1812 John Lorain of Philipsburg wrote, "The huntsmen burn the woods to obtain a better chance for killing game. . . . This has destroyed vast quantities of timber. . . . Frequent repetitions of burnings have taken place among the young timber which had sprung up after the destruction of the old." [10] Not until after 1840 was the interest of the public in forest conservation fully recognized and legal protective measures enforced.

There were a few comparatively treeless areas; these were eagerly appropriated by the first settlers if the soil was fertile. The Swedes first cultivated marsh land along the Delaware and its tributaries; not until this was fully occupied did they clear forest land. There were limited areas of treeless uplands, commonly known as "Indian fields." Thomas Paschall, writing in 1683, says, "I know a man, together with two or three more, that have happened upon a piece of Land of some Hundred Acres, that is all cleare, without Trees, Bushes and Stumps, that may be Ploughed without let."[11]

Small cleared areas near streams were mostly the sites of abandoned Indian villages. Large cleared areas had resulted from periodic firing of the woods by Indians in pursuit of game; these were particularly helpful to the first settlers of Lancaster and York counties. "The flats of Pequea," says Redmond Conyham, "were natural meadows on which grass grew luxuriantly, which proved a great source of comfort to the new settlers."[12] Pioneer farmers of that county harvested their first crops of hay on these natural meadows.

Lancaster County pioneers found a considerable area of burnt-over land that was densely covered with young saplings; they called these areas *grubenland,* from the German *grub*, a small tree. One such area lay west of the present borough of Lititz; another was in Ephrata Township, between Middle and Cocalico creeks. "When the first settlements were made in York County," says A. J. Glossbrenner, "the great portions of the lands in the eastern and southeastern parts were destitute of timber of greater magnitude than the scrub-oak."[13] In Franklin County, "A great part of the best lands in the Conococheague Valley were, at the first settlement of the country . . . without timber, covered with a rich, luxuriant grass with some scattered trees of hazel bushes, wild plums and crab-apples. It was commonly called 'The Barrens'."[14]

As the pioneers advanced westward they found, here and there, breaks in the vast forest. The city of Clearfield stands on the site of the Indian village of Chincleclamosse, which was surrounded by fields cleared by the redmen.[15] West of the Alleghenies "natural prairies" were found in a few places. In 1810 Christian Schultz reported, "French Creek is bounded on both sides by tracts of low, rich lands among which are several natural prairies producing a strong, luxuriant grass, unobstructed by the growth of a single tree. . . . Here the emigrant may knock up a hut on the day of his arrival, set fire to the grass on the next, and on the third day may plow up a field, his only difficulty is that of fencing."[16]

The character of the soil mantle that covered Penn's Woodland did not receive careful scrutiny by early settlers save as to the abundance, kind and size of the trees that grew upon it; they considered these a reliable index to its crop-producing power. "The land containeth divers sorts of earth," said William Penn, "as sand, yellow and black, poor and rich; also gravel, both long and dusty; and in some places a fast, fat earth, like our best vales in England, especially by inland breaks and rivers."[17] Edd Jones, writing from the Welsh Tract on June 26, 1682, said, "As for y^e land we look upon it [as] a good & fat soyle, generally producing twenty, thirty & fourty fold."[18]

George Washington, one of the most progressive farmers of his time, paid this tribute to the fertility of certain Pennsylvania soils: "The lands . . . in Franklin County, Pennsylvania . . . are inferior in their natural state to none in America."[19] Had he been more familiar with Pennsylvania he might have applied this encomium to many other parts of the state. In 1789 Dr. Benjamin Rush, the celebrated Philadelphia physician, designated Strasburg and Manheim in Lancaster County, Lebanon then in Dauphin County and Bethlehem in Northampton County as "centers of the most productive soils of the state."[20]

LAND AREA OF PENNSYLVANIA

Penn's charter defined the eastern boundary of the province as the Delaware River; from thence it extended westward five degrees longitude. It was "to be bounded on the north by the beginning of the three and fortieth degree of north latitude; and on the south by a circle drawn twelve miles distant from New Castle [Delaware] northward and westward, and then by a straight line westward to the limits above mentioned." It comprised 35,361,300 acres, including the "lower counties," now the state of Delaware.

Pennsylvania might have been a small state, less than a third of its present size, if the proprietaries had not prosecuted boundary disputes with skill and vigor. Philadelphia would have been in Maryland and Pittsburgh in Virginia if the claims of rival colonies had been allowed. Pennsylvania would have been reduced to a narrow strip through the center of the present state about seventy miles wide and 240 miles long. Some of the best farm land and a large part of the mineral wealth would have been excluded.

Lord Baltimore claimed up to the fortieth degree north latitude, which is just north of Philadelphia, thence westward. On May 10, after prolonged litigation, he and Penn's heirs signed an agreement establishing the present boundary, the Mason and Dixon Line, which was run in 1763.

Southwestern Pennsylvania was claimed by Virginia whose charter granted it territory "running west and northwest up into the country from sea to sea," and comprising the present counties of Westmoreland, Fayette and Allegheny. Virginia was more active than Pennsylvania in substantiating its claim. Beginning about 1773 it made settlements as far north as Pittsburgh. Some squatters came into the area from eastern Pennsylvania, but they were outnumbered by Virginians. Many land disputes arose between the two groups. "Virginia entries" in the records of the Land Office of Pennsylvania cover 633,000 acres. In 1799 a joint commission agreed on the southern and western boundaries as they are today.

The northern third of Pennsylvania, between the forty-first and forty-second degrees north latitude, was claimed by Connecticut. Its royal charter of 1662 defined the colony as extending westward to the Pacific except territory "then possessed by other Christian prince or state." This exempted New York. Penn's charter from the same monarch, Charles II, included the area claimed by Connecticut, but since it was granted nineteen years after the charter of Connecticut that colony considered that it had prior right.

In 1753 the Susquehanna Company was organized in Wyndham County, Connecticut, to take possession of the supposed westward extension of the colony. In February, 1769, forty Connecticut men came into the Wyoming Valley and built a blockhouse (Forty Fort). They were soon followed by two hundred settlers and their families. The year before, however, the Six Nations had given the Penns a deed to the disputed area.

Thus the issue was joined. Unlike the boundary disputes with Maryland and Virginia, it was a bloody affair. Both Connecticut and Pennsylvania settlers were ejected from the valley, alternately, several times and their homes burned. Many were killed. Intolerance, greed and cruelty existed on both sides; the "Pennamite Wars" are one of the blackest chapters in Pennsylvania history.

At the close of the Revolution the Pennsylvania legislature petitioned Congress to adjudicate the dispute. On December 30, 1782, the court rendered a unanimous verdict in favor of Pennsylvania. Not until 1807, however, were the settlers from New England in undisputed possession of the land, as Pennsylvanians. This happy outcome of the controversy had a profound influence on the political and economic life of the Commonwealth. Pennsylvania could ill afford to have lost the great agricultural and mineral wealth of the area in dispute or, what is far more important, the genius of the New England stock which was introduced into the rural and urban life of the state.

The "Erie Triangle," between the 42nd parallel and Lake Erie, was claimed by New York and Massachusetts. Both ultimately ceded their interest to the Federal government; this made it possible for Pennsylvania to purchase the area in 1792. The 202,187 acres cost $151,640.25, or at the rate of seventy-five cents an acre, which is but a fraction of the present annual income from agriculture alone. At the time, it was hoped that the port of Erie would draw traffic of the Great Lakes through Pennsylvania to tidewater at Philadelphia, but New York prevented this dream from coming true by building the Erie Canal.

LAND POLICY UNDER THE DUTCH, SWEDES AND DUKE OF YORK

The brief tenure of the Dutch on the Delaware before the coming of the Swedes was not evidenced by land titles; they were more interested in trading with the Indians than in farming. Under the government of New Sweden no land was owned in fee simple by an individual; title was vested in the Swedish Crown. Only such an amount of land was assigned to an individual as he could cultivate. He was required to pay three florins annually as quit-rent. After New Sweden was taken by the Dutch in 1672, Swedish farmers were summoned to take oath of allegiance and to secure Dutch title to the land they occupied. They were expected to have the land surveyed at their own expense and to pay an annual quit-rent equivalent to 3.6 cents an acre. Many refused to comply.

In 1674, when the English took possession of the Delaware, all farmers along the river—Dutch, Swedes, Finns and English—were ordered to take out new titles as tenants of the Duke of York and to pay quit-rent of a bushel of wheat per hundred acres, if demanded. Many farmers, perplexed and exasperated by these frequent changes in governmental regulations, refused to obey the directive; they became squatters. As reported by Acrelius in 1759, "A part took the deeds, but others did not trouble themselves about them but only agreed with the Indians for a piece of land. . . . Hence it comes that in lawsuits for land people still appeal to 'Indian rights,' which are valid when they can be proved." [21]

Among laws promulgated by the Duke of York for the government of the colony, one specified that "No sale or alienation of Houses and Lands within this Government shall be holden good in Law except the same be done by deed in writing, under hand and seal . . . said deed to be acknowledged and Recorded according to Law." [22] The Court at Upland (Chester) recorded titles and transfers. This law was continued in force by William Penn in his Great Law.

LAND POLICY UNDER WILLIAM PENN

In 1681 title to Pennsylvania passed to William Penn who then became the largest land owner in the New World. The royal charter constituted him the "true and absolute proprietary of the country"; but the sovereignty of the King of England was recognized by the annual payment of two beaver skins and a fifth of all gold and silver mined. The proprietor could lease, mortgage, sell or transmit to his heirs all or any part of this vast private estate.

William Penn was, of necessity, a land salesman as well as political governor of the province; this dual and often conflicting relationship was a constant source of embarrassment to him and to his heirs. Purchasers of land held title immediately from Penn, not from the Crown, but the holding was in the nature of a tenement, not in fee simple, hence it was subject to quit-rents.

The land policy of William Penn was quite democratic for that period. Most land in Europe still was held on feudal tenure; ownership was vested in comparatively few landed gentry who rented their great estates to tenant farmers, often at exorbitant rates. Tenants had practically no opportunity to own farms, even though they exercised great skill and thrift; title to land could be transferred only by elaborate feudal methods. Land ownership carried with it economic, social and political advantages which were forever denied to most of those who actually tilled the soil.

The desire of William Penn, on the other hand, was to found a colony of small, independent land owners. He sold some large tracts, mostly before coming to America, and established a number of so-called "baronies" and "manors." But the great majority of his sales was to small freeholders. His policy was in marked contrast to that in some of the other proprietary colonies, as New York and Maryland. There great private estates were created, the owners of which enjoyed special privileges, and there too it was very difficult for a poor man to own land.

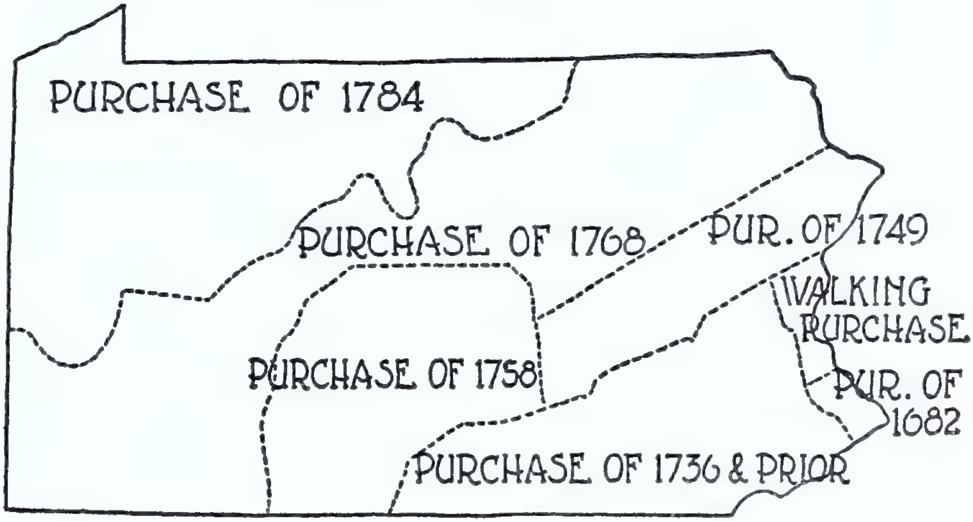
In Penn's advertisements of his province in eastern European countries he stressed the opportunity it presented for a poor man to own a farm. Ownership of land in Pennsylvania was to confer no special privileges, as it did in Europe, although for a short time it was made a condition to the franchise and to holding office. The democratic land policy of Penn, no less than his charter of civil and religious liberty, made Pennsylvania the haven of the oppressed and homeless of all nations.

Penn's heirs, unfortunately, were not motivated by the high humanitarian ideals of the founder. They looked upon the province, not as an experiment in democracy, but as a private estate on which the smallest possible sum should be expended for improvement and development and the largest possible income derived for themselves. This policy alienated the confidence of the people and led to bitter disputes long before the Revolution deprived the proprietaries of their province.

LAND PURCHASES FROM THE INDIANS

When the Swedish colony was established it was charged by the Crown to purchase land from the Indians at a fair price and to live peaceably with them. This royal command was faithfully obeyed. The price of land was not munificent. According to Peter Kalm, "For a piece of baize or a pot of brandy or the like they would get a piece of ground which at present [1749] would be worth more than four hundred pounds Pennsylvania currency. When the Indians sold a piece of land they commonly signed an agreement; and although they could neither read nor write they scribbled their marks, or signatures, at the bottom of it . . . one whose name signified a beaver drew a beaver; another drew a bow and arrow; and a third a mountain instead of his name." [23]

William Penn insisted that no land be occupied until the Indian rights to it had been purchased. The Indians had a high regard, approaching reverence, for "Onas," as they called the great Quaker. Penn purchased only a small body of land along the Delaware, not enough to endanger the subsistence of the Indians; later purchases were by his heirs. The first transactions were with the Lenni-Lenapes, or Delawares, who occupied the area; subsequent purchases were from the Iroquois, or Six Nations, who were over-lords of the tribes in Pennsylvania with headquarters in New York.



The first purchase was on July 15, 1682, when the area between the Falls of the Delaware (opposite present-day Trenton) and Neshaminy Creek was secured. This transaction was confirmed by Penn at his historic goodwill conference with the Indians on October 24, 1682, held beneath the "Treaty Tree," a majestic elm on the bank of the Delaware at Shackamaxon, now Kensington. In 1718 Penn made a larger purchase, covering all land "between the Delaware and Susquehanna rivers, from Duck Creek . . . to the Lehigh Hills." In 1736 Penn's heirs bought from the Iroquois a much larger tract, confirming all previous purchases and including about one-sixth of the present state. The next acquisition was in 1749, when a tract lying north of previous purchases and extending from the Delaware to the Susquehanna was secured. It included the present counties of Pike, Monroe, Carbon, Schuylkill, and Dauphin.

A large area west of previous purchases was negotiated with the Iroquois in 1754 but because of the dissatisfaction of the Indians at the way this tract was surveyed they repudiated the treaty. In 1758 the proprietaries re-bought this tract together with a large area west of the Susquehanna extending to the southern boundary of the province. By far the largest purchase was in 1768, by treaty with the Iroquois at Fort Stanwick (Rome, N. Y.). This "New Purchase" extended diagonally across the province from northeastern to southwestern boundaries. This left over one fourth of the province still under the title claim of the Indians.

In 1780 the General Assembly set aside certain lands north and west of the Ohio and Allegheny rivers as "Donation Lands," for soldiers of the Revolution who had served in the Pennsylvania Line.[24] In 1783 other lands in the same general region were designated "Depreciation Lands," to be used to cancel certificates of depreciation that had been given to soldiers of Pennsylvania during the Revolution in compensation for the great depreciation in Continental currency. Neither of these areas could be opened to settlement until the Indian rights thereto had been extinguished. This was done by deed from the Six Nations on October 23, 1784. The purchase price was $5,000. Since the Eries and Wyandots were not a party to this transaction, on January 31, 1785, they executed a quit-claim deed to the area at Fort McIntosh (Beaver) for a consideration of $2,000. The last purchase was on March 3, 1792, when Indian rights to the Erie Triangle were extinguished.

Not all land purchases from the Indians were conducted with the fairness that characterized the dealings of William Penn with them. Before the surveyor's compass and chain came into common use it was customary to use a horse or a man in measuring land. A deed might state that the land being transferred was "to extend northeasterly back into the woods to make a two day's journey as far as a man can go"; or "as much land as a man can travel in two days on a horse."

The "Walking Purchase" of 1737, in Bucks County, was a particularly flagrant breach of good faith. The proprietary negotiated for the purchase of an area that could be covered by a man walking for a day and a half. A trained man was employed, one who could easily outdistance even the most active Indian. He walked sixty miles in the allotted time. The Indians were astounded and enraged. They protested to the proprietary that "The white brother made too big a walk," but the protest was unheeded. The purchase of 1754 was surveyed with compass and chain, of which the Indians knew nothing. They were amazed that the survey included so much more land than they thought had been agreed upon. These and other tricky transactions turned them against the whites; the era of good feeling between the races inaugurated by the Swedes and William Penn came to an end.

In early transactions at least, the Indians had no conception of the meaning and binding force of the fee simple title of the white man. When they sold land they thought they were merely admitting the purchaser to the privilege of hunting on it, along with themselves. Moreover, an Indian tribe rarely had sole possession of any area; in purchasing a certain tract it might be necessary to deal with several tribes. This problem was simplified in Pennsylvania since the Iroquois then held all the tribes of Pennsylvania in subjection. Except for the initial purchases, all negotiations were with the Iroquois only. Indians had no scruples about selling the same land to more than one buyer; it was a common occurrence for each of the parties in a dispute about title to show similar deeds to the same tract.

The "consideration" usually was insignificant. As illustrative of the general character of these transactions a deed for land purchased within the present limits of Delaware County, in 1683, may be cited:

"We, Secane & Icquoquehan, Indian shackmakers and right owners of y^{e} Land Lying between Manaiunk, als Sculkill and Macopanachan, als Chester River, doe this 14 th. day of y^{e} fifth month, in y^{e} year according to English account 1683, hereby graunt and Sell all Right & Title in y^{e} s^{d} Lands Lying between y^{e} s^{d} River, beginning on the West side of Manaiunk called Conshohocken, & from thence by a Westerly Line to y^{e} s^{d} River Malopanackhan, unto William Penn Propriet^{r} & Govern^{r} of y^{e} Province of Pennsilvania & c., hiss heirs & Assignees for Ever, for and in Consideration of 150 fathom of Wampon, 14 Blanketts, 65 yds Duffells, 28 yds stroud watrs, 15 Gunns, 3 great Kettles, 15 small Kettles, 16 pr. stockins, 7 pr. Shoes, 6 Capps, 12 Gimblettes, 6 Drawing Knives, 15 pr. Sissors, 15 Combes, 5 Papers Needles, 10 Tobacco boxes, 15 Tobacco Tongs, 32 Pounds Powder, 3 Papers Beads, 2 papers red Lead, 15 Coats, 15 Shurts, 15 Axes, 15 Knives, 30 barrs Lead, 18 Glasses, 15 Hoes, unto us in hand paid, the receipt whereof is hereby acknowledged, have renounced all Claims & Demands for y^{e} future from us o^{r} heirs or Assignes in or to y^{e} prmises." [25]

The Indians were shrewd enough to recognize that they were poorly compensated. After the purchase of 1784-5 Chief Whole Face said, in effect, to James Dickinson: "Many of our Young Warriors are dissatisfied with the Reward we received for the Lands, thinking it not enough for so large a Body, it not being one pair of Mokasons a piece."[26] After William Penn, the standard procedure of the whites was to ply the negotiating chiefs with "fire water" until they were drunk and would sign any kind of a contract. However enraged they might be when they came to their senses they could do nothing to redress the injustice except to go on the warpath. So they withdrew farther and farther into the interior and eventually to practical extinction in this part of the country.

LAND TITLES

After securing title to his domain William Penn wrote "Some Account of the Province of Pennsylvania," in April 1681. This preliminary statement was expanded as "Conditions and Concessions," on July 11, 1681. Penn divided his land into three classes: (1) Common land, comprising most of the province. It was his original intention that this would be sold at a uniform price. (2) Proprietary tenths, or manors, One tenth of the choicest land in each large tract opened to settlement was to be reserved for the use of the proprietaries. (3) Private estates of individuals, obtained by purchase, by gift from the proprietary or by transfer.

Penn began to sell land before he came to America. Sales to these "first purchasers" were in parcels of 250 to 10,000 acres but were mostly in "shares" or "properties" of 5,000 acres each. These tracts were not designated as to location and were not surveyed at the time of sale; this was a prolific source of confusion later. Penn stipulated that grantees must settle upon their land within three years after a survey had been made, otherwise it would revert to the proprietary. Over 300,000 acres were sold before Penn came to America, mostly to Quakers of southern England and Wales. First purchasers were to have special privileges as to location, called "old rights." When Penn first set foot on his province, on October 28, 1682, the roll of first purchasers was closed.

Following is a sample of land deeds issued by William Penn:

"This Indenture witnesseth y^{t} William Penn of Horninghurst in y^{e} county of Sussex, England, for & in consideration of Twelve pounds four shillings to him in hand paid Hath by these presents granted Three Hundred Seventy-five acres of Land Cleare of Indian incom-branches in the Province of Pennsylvania (toward the Susquehanna River) to John Kennerly of Shavingta, County Chester, cheese factor, his heirs and assignees & him thereof of enfeoffed every acre to be computed according to the statute of y^{e} thirty-third year of King Edward the First, to have and to hold to him his heirs and assignes for ever, together with all & every the Lands, Isles, Islands, Mynes, Mineralls (Royall one Excepted), Woods, Fishings, Hawkings, Fowlings, & all other Royalltyes, Profits, Comodityes & Heraditaments insoever unto the same—belonging, Yielding & Paying therefor yearly and every year unto y^{e} s^{d} William Penn his heirs and assigns immediately from and after the expiration of y^{e} first five years next after the day of y^{e} date hereof the Rent of one shilling for every hundred acres of y^{e} s^{d} Three hundred seventy-five acres NEVERTHELESS the s^{d} William Penn for himself his heirs & assignes doth agree to & with the s^{d} John Kennerly his heirs and assignes y^{t} y^{e} s^{d} Rent of one shilling for every hundred acres of y^{e} s^{d} three hundred and seventy-five acres is only to becum due & payable immediately from & after the taking up & seating of y^e s^d lands & not before & proporeanbly for y^e s^d rate for every Quantity thereof y^e y^t shall be taken up & seated & not otherwise." [27]

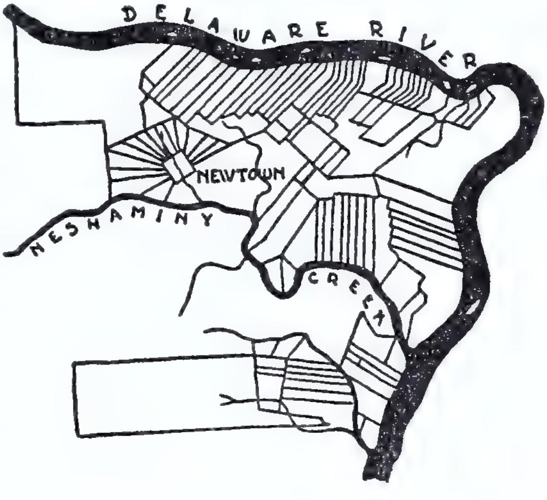
Penn established a Land Office as soon as he arrived. The terms of the Land Office warrants varied greatly, according to the financial condition and needs of each purchaser. The following is from the *Warrant Book from 1683 to 1720:*

"Upon an agreement now made with John Cadwallader of the County of Chester for 200 acres of land situate near the land laid out to Jeremiah Jermain in said county, for which the said John is to pay to the Proprietary's use five-and-twenty pounds and the usual quit-rent of two shillings sterling for the same. To be surveyed upon condition that it has not already been surveyed or appropriated nor is seated by the Indians and that the said Cadwallader pay down at the survey twelve pounds ten shillings and the like sum within three months after the date hereof, then this shall be valid, otherwise void."

All patents (original titles) contained the following reservation: "Three full and clear fifth parts of all Royal Mines, free from all deductions and reprisals for digging and refining the same, and also one fifth part of the ore of all other mines delivered at the pit's mouth, only excepted and reserved." What a princely income this would yield to the King of England today if the provision were still in effect!

Patents were in fee simple save for the feudal provision of annual quit-rents. Subsequent land transfers were by indentures; both copies of the parchment on which these were written had identical indented or irregularly notched edges at the top and bottom. Indentures were used before land transfers were recorded; identical copies were kept by buyer and seller and validity of title was evidenced when the indentures of the two copies corresponded exactly.

Even after making allowance for the unavoidable confusion incident to a new settlement, the business methods of William Penn were very loose. The "old rights" of first purchasers who did not come to America were granted again to others. Many deeds were not recorded at all. Some grants were not surveyed or even located. Records of land sales and transfers



Portion of the Thomas Holme map of Bucks County made in 1686.

were filed with other papers of the colony and were not indexed. Naturally enough, there were numerous controversies over titles. Absence of documented records made Penn the victim of unscrupulous land sharpers and his long absence from the colony added to the confusion.

Soon after his arrival in 1681 Thomas Holme commenced a survey of the province. This was published in London in 1686; it showed land then seated and by whom. When Thomas Penn assumed control of the province in 1732, he attempted to bring some order out of the chaos at the Land Office, but with little success. Loose administration of that office continued throughout the proprietary period.

The Land Office consisted of a Secretary who also was Secretary of the Province, a Surveyor-General and three to five Land Commissioners. In 1689 the office of Receiver-General was created to handle funds. As population increased, deputy surveyors and receivers were appointed in the several counties. After 1741 a Territorial Commission was empowered by the Governor to make grants of land on warrants issued by the Secretary under the seal of the Land Office.

The customary procedure was for a prospective buyer to make application to the Land Office in writing, designating the general location of the tract he desired to purchase. The proprietary or his agent then issued a warrant directing the Surveyor-General to make a survey and defining the terms of the sale. The buyer was supposed to pay in full before patent was issued but not always was this done. As a result, the proprietary incurred large losses.

Rarely were delinquents evicted. In 1740 there were 260,000 acres for which patent had been granted but on which no payments whatever had been made; and about 400,000 acres more were occupied without warrants. Often there was protracted delay, sometimes fifteen years or more, in issuing patents for land that was being farmed by the purchaser, the contract of agreement being held by the proprietary meanwhile until payment was completed. These cases were numerous, since most pioneer farmers had to earn the money to pay for their farms from the land itself.

Considerable ill feeling against the English developed among Swedes who had occupied land before the coming of Penn. Most of them had settled along streams back of Tinicum Island and the lower reaches of the Schuylkill, especially on Christiana and Brandywine Creeks. As judged by English law many of their titles were defective. Some English took advantage of this situation to escheat titles to desirable tracts which the Swedes considered theirs by reason of long occupation and improvement. Said Peter Kalm, "When Penn came he took much land away from the Swedes and the Dutch who lived near Philadelphia and gave it to the Quakers, under the pretext that the Swedes had more land than they needed and that otherwise it would lie waste and uncultivated. Much land was taken away by fraud and whenever [the higher authorities] got hold of the old deeds, describing how much land had been apportioned to each one, the Swedes and Dutch never had them returned." [28]

Under the law of 1707 the Swedes were required to take out new deeds for the land they had occupied for a generation or more. The cost was thirty shillings (about $4.50) for the survey and registration and an annual quit-rent equivalent to $2.00 per hundred acres. Previously they had paid a much smaller quit-rent. Rather than submit to regulations which they considered unjust, many abandoned their farms and squatted on new land.

LAND PRICES AND QUIT-RENTS

Land sold by William Penn to first purchasers was priced at £100 per 5,000 acres, plus an annual quit-rent of one shilling per hundred acres, which was not to be imposed until after 1684. Until 1732 the usual Land Office price to small purchasers was £5 per hundred acres, plus one shilling quit-rent annually. In 1732 the price was increased to £15½ per hundred acres with one half penny quit-rent per acre annually. There was considerable deviation from these general prices. The General Assembly made repeated attempts to secure some degree of uniformity in the price of unseated land and in sale procedure but these efforts were resented by the proprietary as an infringment on their charter rights.

Penn's charter authorized him to establish manorial land tenure and to impose quit-rents. These were a survival of feudal Europe when ruling lords protected peasant farmers under their jurisdiction from outside aggression in return for such payments. Quit-rents were based on the theory that occupiers of land were merely tenants of the King, to whom tribute was due, either direct or through the proprietary.

Under the Swedish Crown the quit-rent was one bushel of wheat per 100 acres; this was equivalent to about half a cent an acre since wheat then was taken for taxes at Upland at the rate of forty-five cents a bushel. The quit-rent under William Penn before 1719 was one shilling per hundred acres; then it was increased to two shillings. In 1732 it was raised to one half penny an acre on all new patents; and in 1768 to one penny.

At the discretion of the proprietary the obligation could be paid in wheat, flour, beaver skins or other commodities; or it could be satisfied by a token payment, such as a red rose, pepper corn, buck's foot or Indian arrow.

The reluctance of farmers to pay tribute to royalty was responsible for very poor collection of quit-rents. At the time Penn's charter was granted this archaic system was tolerated in England only because of its antiquity. When imposed upon a wilderness colony like Pennsylvania, where a new conception of human freedom was being evolved, it was wholly out of place. It is probable that William Penn, who was far in advance of his time in democratic ideals, would not have sanctioned this remnant of feudal vassalage had it not been required of him in his charter.

When Penn returned to England in 1684 he had sold 600,000 acres of land for £20,000 cash and had received £500 in quit-rents. Thereafter collections were increasingly difficult. In 1702 James Logan informed him, "Of all the rents in Bucks County I have secured but one ton and a half of flour." On another occasion he complained, "Bucks County is exceedingly degenerate of late, pays no taxes." [29] Occasionally there was violent reaction, especially among Scotch-Irish who had come to the New World, among other reasons, to escape payment of tribute to royalty. The proprietaries were exceedingly lax in making collections of quit-rents; not until 1742 was a roll prepared.

The Revolution swept away all traces of feudal land tenure in Pennsylvania. Quit-rents were abolished by action of the General Assembly in 1799. Not until then did Pennsylvania farmers have full and undivided ownership of their land, a privilege which New England farmers, who were not under proprietary government, had enjoyed from the first settlement.

Symbolic quit-rents occasionally were made part of land transfers. In 1762 Peter Laux bought a farm from William Allen of Bucks County for £300, 15 s., 9d. He obligated himself "to pay forever the yearly rent of one pepper corn on the sixteenth day of November, in every year, if the same shall be demanded." Pepper corn is the dried berry of the black pepper plant. Usually the payment of the token was not demanded. To this day the congregation of Zion Lutheran Church, Manheim, Lancaster County, in a beautiful ceremony, pays a red rose to the heirs of "Baron" Stiegel; this is the annual "Feast of Roses" of the community. Similar ceremonies reminiscent of olden times are held by the Tulpehocken Reformed Church of Lebanon and by several other groups.

SIZE OF HOLDINGS

Inheritance laws of the province tended to favor small holdings and to break up large estates. By the law of primogeniture as then practiced in England, if there was no will the oldest son inherited all the landed estate. By the law of entail all realty was sent down for generations in the line of the oldest male.

These customs of feudal Europe were practiced quite generally in colonial Virginia and New York, but in Pennsylvania a much more democratic procedure prevailed. Equal distribution of the realty of an intestate among all the children was practiced until 1705, when a provincial law provided that the oldest son should have a double share and the other children, daughters included, one share each. This "Mosaic code" survived until the Revolution, when both primogeniture and entail were swept aside everywhere in the New World. The Scotch-Irish proceeded on the theory that all girls would marry and hence needed no estate; so, in their wills, they generally devised about nine tenths of the estate to their sons and divided the remaining tenth among their daughters.

Pennsylvania agriculture generally has been individualistic, not communistic. A few religious groups, such as the Harmony and Ephrata settlements, tilled a large acreage cooperatively, but after a few years most members succumbed to the powerful urge for individual holdings.

At the time of the English settlement of America practically all English farmers lived in rural villages. Village type of agriculture was transferred to the earliest English settlements in America, New England and Virginia. New England settlers lived in villages from whence they went out to work on their respective farms, as in England. A considerable area of land was held in "common," especially for grazing. In the early years of the Virginia colony there was no private ownership of land; the products of the labor of the settlers were turned into a common pool. The colony did not prosper until private ownership was substituted for communal ownership. In Pennsylvania, on the other hand, small self-sufficing farms widely scattered in the open country have prevailed from the beginning.

William Penn could not divorce himself entirely from the English village type of farming in planning for the settlement of his province. Before coming to America he expected to sell much land in large blocks to "Companies of Adventurers." For them he provided: "A tract of Land shall be survey^{d}, say Fifty Thousand Acres to a hundred Adventurers; in which some of the best shall be set out for Towns or Cities; and there shall be so much Ground allotted to each in those Towns as may maintain some Cattel and produce some Corne; then the remainder of the fifty thousand acres shall be shared among the said Adventurers (casting up the Barren land for Commons and allowing for the same) whereby every Adventurer will have a considerable quantity of land together; likewise every one a proportion by a navigable River, and then backward into the country." [30]

In 1682 Penn directed, "For the more convenient bringing up of the youth, the solitary farmers living in the province shall all remove to market towns, so that the neighbors may help one another in a Christlike manner and praise God together, and that they may accustom their children also to do the same." [31] There is no evidence that this directive was observed. In 1685 he wrote, "We do settle in the way of

Townships or Villages each of which contains 5,000 acres, in square, and at least Ten Families; the regulation of the Country being a Family to each five hundred Acres."[32]

Penn's plan for village organization of agriculture was not realized; only at Germantown was any attempt made to conform to it. Most English, German and Scotch-Irish settlers desired to live on separate farms in the open country, as had the Dutch and Swedes before them. For several years Penn continued to enjoin county justices to "endeavor to seat the lands by way of townships, as three thousand among ten families; if single persons, ten thousand acres among ten of them." His plan of township surveys was soon abandoned; individual surveys to meet the needs of each purchaser became the rule.

Most of the land was sold in tracts of 100 to 500 acres. Penn said, "My Conditions will relate to three sorts of People; 1st., Those that will buy; 2dly., Those that take up land upon Rent; 3dly., Servants."[33] The renters were to be required to pay "yearly one penny per Acre, not exceeding Two Hundred Acres." When indentured servants were brought from Europe, Penn proposed to give "Fifty Acres to the Master for every Head, and Fifty Acres to every Servant when their time is expired." Very few desired to rent since land could be purchased so cheaply.

Penn sought to keep speculators from acquiring large tracts of land for re-sale but was not always able to prevent this. His heirs were even less successful. According to John Gibson, "Nearly all land purchased by the first settlers [York County] was taken up in 100, 200 and sometimes 300 acre tracts . . . Much of the land, however, was taken by English speculators who disposed of their holdings to German immigrants at a profit."[34] Seeking to correct this abuse, in 1765 the proprietaries adopted the policy of restricting sales to 300 acres per individual, except by special order. In 1782 Benjamin Franklin informed a European audience, "There are few great Proprietors of the soil and few Tenants; most people cultivate their own Lands."[35]

Penn's charter from the King provided: "Wee give and Grant Licence vnto the said William penn and his heirs . . . to erect any parcells of Land within the pvince aforesaid into Mannors . . . to haue and to hold a Court Baron . . . and to haue and to hold view of ffrank pledge for the conservation of the peace."[36] A "Court Baron" was a court composed of the tenants of the lord of the manor or barony; it was authorized to mete justice in all actions arising within that jurisdiction, but its decisions were subject to review and possible veto by the lord.

Penn's plan of settlement provided that any purchaser of 10,000 or more acres might establish a baronial or manorial court. In no case, however, was such a court established; the baronies and manors established were such in name only and were handled like any other large tract of land. Such a property was the "Welsh Barony" of 40,000 acres in Montgomery County. The hope of the purchasers was to establish a self-governing democracy entirely independent of provincial government. This plan miscarried because not enough Welsh came to fully occupy the tract and because of grave misunderstandings between the Welsh and the proprietary. After a protracted controversy that generated much bitterness among the "Ancient Britons," the provincial Land Commissioners ruled, "Resolved; that the lands already laid out in the said Tract unto other purchasers [than the Welsh] be confirmed unto them." So ended the "Welsh Barony." Among other holders of baronies were Dr. Nicholas More who, in 1682, was granted 10,000 acres in Philadelphia County, now Moreland Township, Montgomery County; and Sir John Fagg, to whom Penn gave the 5,000 acre "Barony of Nazareth."

Manors were not distinguishable from baronies, either in size or function. In his "Conditions and Concessions," published in 1681, Penn provided, "In every one hundred thousand acres the Governor and Proprietary by lot reserveth ten thousand acres to himself, which shall lie in one place." Under this provision land was withdrawn from sale and designated as manors whenever a new purchase was made from the Indians.

Seventy-eight manors were established of which seventeen were in Northumberland County, twelve in Northampton, nine in Chester, seven each in Philadelphia, Bucks, Lancaster and Bedford, six in Westmoreland and three each in Berks and York—as these counties were constituted at the time.[37] The largest was the Manor of Springettsbury, York County, 75,000 acres. The smallest was Lake Paupunauming (Poponming) Manor, Northampton County. The first was Pennsbury, Bucks County, seat of William Penn, 8,431 acres. The last manor was established two years before the Revolution. Long before then manors and baronies had ceased to have any significance other than as a real estate investment. The proprietaries were deprived of their lordship over Pennsylvania soil by the Divesting Act of 1779 but were permitted to retain all manors surveyed prior to July 4, 1775 which had not yet been sold.

The following partial list of manors indicates their wide distribution and variation in size:

Mount Joy Manor, Philadelphia County, 5,000 acres, 1683.
Manor of Perkasie, Bucks County, 11,462 acres, 1701.
Conestoga Manor, Lancaster County, 16,000 acres, 1717.
Ruscombe Manor, Centre County, 10,000 acres, 1735.
Shaver's Creek Manor, Huntingdon County, 2,608 acres, 1760.
Tulpehocken Manor, Lancaster County, 7,510 acres, 1765.

Manor of Succoth, Centre County, 820 acres, 1766.
Manor of Pomfret, Northumberland County, 4,766 acres, 1768.
Muncy Manor, Lycoming County, 1,615 acres, 1768.
Manor of Pittsburgh, Allegheny County, 5,776 acres, 1769.

SQUATTER RIGHTS

A large proportion of the land, perhaps most of it, was occupied by settlers without legal sanction, as squatters. Squatter sovereignty was favored by abundance of good land, loose business methods of the proprietaries, overwhelming number of immigrants and slowness of the proprietaries to extinguish Indian titles. Most of the settlers who went into the "back country" during the first half of the eighteenth century, especially in the period of greatest German and Scotch-Irish immigration (1718 to 1732) did not take the trouble to acquire title from the proprietaries but simply seated themselves on unoccupied land. James C. Ballagh states, "Of the 670,000 acres occupied between 1732 and 1740, it is estimated that 400,000 acres was settled without grants."[38] During this period management of the proprietary lands was in a state of great confusion. The Land Office was practically closed from 1718 to 1731, after the death of William Penn. Squatting became the commonly accepted method of acquiring land.

The proprietaries resented this encroachment on their rights under the royal charter for it deprived them of income, but they were powerless to enforce these rights. German and Scotch-Irish immigrants were about equally remiss in this respect. In 1724 James Logan, Secretary of the Province, alarmed at the lack of respect shown to the vested interests by newly arrived settlers, complained, "They [Scotch-Irish] have generally taken up the western lands; and as they rarely approach me to propose to purchase I look upon them as bold and indigent strangers, giving as their excuse when challenged for titles that we had solicited for colonists and they came accordingly." The Scotch-Irish, he asserted, "settled in an audacious and disorderly manner," giving as their justification, "It is against the laws of God and nature that so much land should be idle while so many Christians want it to labour on and to raise their bread." This specious argument fooled nobody, not even its proponents, but it served their purpose.

The more placid German immigrants were no less difficult to control in this respect. Said Logan, "They come here in crowds from Germany, where many of them have been soldiers. All these go on the best vacant lands and seize upon them as common spoil." In 1727 he branded both nationalities, impartially, as land-grabbers: "Both these sects frequently set down on any spot of vacant land they can find without asking any questions . . . Both they and the Palatinates pretend they will buy but not one in twenty has anything to pay with."[39]

Richard Peters, who succeeded Logan as Secretary of the Province, endeavored to collect from frontier squatters. In 1743 he journeyed from Philadelphia to Marsh Creek, Lancaster County with a sheriff, determined either to collect the monies due the proprietaries or dispossess the interlopers. He accomplished neither; the squatters assembled in force and compelled him and the majesty of the law to retire.

In 1750 Peters wrote the proprietary, "The Range of Country said to be seized by these vile people extends from the Juniata and its waters all along the Indian Path through both Coves, about half way to the Allegheny." [40] He was particularly incensed against these settlers because they occupied land that had not yet been purchased from the Indians and he feared Indian reprisals on the older settlements. In May 1750 Peters led an imposing expedition of magistrates and military against them. Let him tell the story: "We took our Rout [from Harris' Ferry] into the center of the Tresspassers on Little Juniata, or what is called Sherman's Creek . . . By this short cut we came on the Settlements at Juniata by surprise, took them Prisoners, burnt their houses, and sent the chief Mutineer to Jayle . . . The Company then proceeded to Path Valley and effected the work there, destroying and burning small houses." [41] Two years later, however, Peters was forced to report to his principals, "The Trespassers beyond the Hills still continue, nay are considerably encreased, and it is an exceeding embarassment to know what to do." [42] This was the invariable result of such punitive expeditions; the settlers quickly returned and built new cabins.

The first cabins on the frontier usually preceded purchase of the land from the Indians, hence the pioneers had no legal title to their holdings. The tomahawk that they carried for fighting Indians also was an excellent woodsman's tool. They used it to blaze or deaden trees in marking out a claim to land that they hoped, ultimately, to occupy. In the early days of the frontier "tomahawk claims" were considered as valid as a deed and were bought and sold. In later years they were looked upon as establishing priority of claim when applications were made to the Land Office for warrants of survey.

Joseph Doddridge, an eye-witness of the scene in southwestern Pennsylvania, records: "A tomahawk right was made by deadening a few trees near the head of a spring and marking the bark of some one or more of them with the initials of the name of the person who made the improvement . . . Those who wished to make settlement on this land . . . bought up the tomahawk improvements rather than enter into quarrels with those who had made them. Other improvers of land with a view to actual settlement took a very different view . . . When annoyed by claimants under those rights they deliberately cut a few good hickories and gave them what was called in those days a 'laced jacket,' that is, a good sound whipping." [43]

This heavy-handed procedure was necessary at times. Some less responsible frontiersmen traveled over the country marking out tomahawk claims to the best sites, not to occupy themselves but to sell to others. Typical of the way many disputes over land titles were settled in southwestern Pennsylvania is the experience of George Teagarden of Greene County: "He had married and the neighbors had gathered for the 'raisin.' In the midst of the festivities a man appeared who claimed the land and forbade the raising to proceed. Teagarden challenged him to fight it out then and there, which they did in a bloody battle. Teagarden won. That settled the issue." [44]

Virginians who located in southwestern Pennsylvania before the boundary dispute was settled were not under the restrictions that hampered settlers from Pennsylvania. Joseph Doddridge, a pioneer from Virginia, says, "Land was to be had here for taking it up; that is, building a cabin and raising a crop of grain, however small, of any kind entitled the occupant to 400 acres of land and a preemption right to 1,000 acres more adjoining . . . if there happened to be so much vacant land or any part thereof adjoining. . . . The government of Virginia appointed three commissioners to give certificates of settlement rights. These certificates together with the surveyor's plan were sent to the Land Office where they laid by for six months to await any caveat that might be offered. If none was offered, the patent was issued." [45]

In remote parts of the province, where squatting was almost universal, settlers often set up "fair play tribunals." In the absence of courts, surveys, and deeds these tribunals adjusted disputes on the boundaries of farms. The functioning of such a neighborhood group in that part of the "New Purchase" now known as Lycoming County is described by Charles Smith: "They formed a mutual compact among themselves and annually elected a tribunal in rotation of three settlers, who were to decide on controversies and settle disputed boundaries. From their decision there was no appeal and there could be no resistance. The decree was enforced by the whole body and the execution and eviction were as sudden and irresistible as judgment. Every newcomer was obliged to apply to this powerful tribunal and, upon his solemn engagement to submit in all respects to this law of the land, he was permitted to take possession of some vacant spot. Their decrees were, however, just; and when *fair play* had ceased, their decisions were received in evidence and confirmed by judgments of courts." [46]

On February 3, 1768, the General Assembly enacted a law designed to strike terror into the hearts of squatters along the Monongahela. If they did not vacate their claims within thirty days after personal notice had been served, "being thereof convicted by their own confession or the verdict of a jury, they shall suffer death without benefit of clergy." This law savored more of the thirteenth than the eighteenth century. It was a dead letter from its enactment.

There were some professional squatters. These took up land, made a small clearing, built a rude cabin and then sold their improvements to a *bona fide* settler and moved farther into the wilderness, there to repeat the process, perhaps several times. This was the way they made a living. Itinerant squatters, however, were few; most pioneers were homemakers.

Gradually it dawned upon the proprietaries that it was futile to try to eject squatters and that these "vile people" had some rights. Men who were courageous enough to venture into the unknown, live under constant danger of Indian attack, and energetic enough to subdue the wilderness were entitled to far more consideration than those who took up land in protected settlements of the East. In 1730 the "law of improvements" was passed. This provided that any settler who had cleared and lived on land not previously sold by the proprietaries or appropriated to their personal use as manors could acquire title by paying the price current at the time of settlement, plus interest and accumulated quit-rents. A distinction was made between "settlement" and "improvement." If a man merely made a small clearing and built a cabin but made no effort thereafter to extend his clearing, he was not entitled to a patent. Few squatters grasped this olive branch.

After 1750 the proprietaries were forced, reluctantly, to recognize squatter rights more fully. "Settlement rights" became the basis of a new type of land title. If a man had cleared land, built a cabin and lived in it, his rights were protected by law. He was expected to pay for the land, ultimately, but this was made easier by giving him preemption rights, or first claim on the land. This, in effect, established a credit system of land purchase. For all practical purposes, it legalized squatting.

Says James Fullerton, "Through hardy perseverence and industry the squatter gained his point and was given special legal protection. The old time 'tomahawk title' gave way to the 'law of improvements'; and the power of preemption protected his rights of priority as a settler. Time has erased to a very great extent the disrepute which the term 'squatter' seems to have called forth and we may now justly look upon the squatter as a pioneer among homesteaders."[47]

The treaty at Fort Stanwick in 1768, by which the proprietaries acquired the "New Purchase" from the Indians, ended their opposition to settlement in that great area. Immediately the Land Office was inundated by applications for warrants of survey. By the first day of the sale, April 3, 1769, there were 2785 applications. Sales to individuals were limited to 300 acres. The price was £5, provincial currency, per 100 acres or at the rate of about thirteen cents an acre. It was not necessary to pay until patent was issued and often this was delayed indefinitely. Improvement rights of squatters were recognized as valid against other claimants, even those of the proprietaries; the Land Office made little or no attempt to compel squatters to protect their titles. Speculators bought many claims to land bounties of men who had served in the French and Indian War and applied them in the New Purchase, but speculation was not as rampant as it was after the Revolution.

THE DIVESTING ACT

For many years there had been agitation for ridding the province of the irksome proprietary government, but the issue did not come to a head until after the Declaration of Independence. On November 27, 1779, the General Assembly passed an Act vesting in the Commonwealth ownership of remaining unseated land and abolishing quit-rents. However, "In remembrance of the enterprising spirit of the founder and of the expectation and dependence of his descendents" the Legislature awarded the former proprietaries £130,000.[48] This was paid, with interest, within eight years after the close of the Revolution. In addition, the legatees of Thomas and Richard Penn were given an annuity of £4,000 by the British government; this was paid for more than a century, when it was commuted for a principal sum. Furthermore, the Penns were permitted to retain ownership of all manors reserved before July 4, 1776 and remaining unsold. It was a very generous settlement.

In accord with English custom the Penns entailed their estate to the first male heir. The last of these, Rev. Thomas Gordon Penn, died September 10, 1869, without issue. William Stewart, Jr., great-great-grandson of William Penn, then became "tenant in tail general" to the estate. On November 11, 1870, he confirmed the title of the Commonwealth to all Pennsylvania land, thereby perfecting certain titles that had been thought to be defective.[49]

Thus the lordship of the Penns over Pennsylvania soil came to an end. It was not a lucrative enterprise for William Penn, largely because of his loose business methods. He was continually on the verge of bankruptcy. In 1708 Penn was forced to mortgage his province to nine British financiers for £6,600. When he died, in 1718, this mortgage had not been paid in full. In 1712 he negotiated with Queen Anne for the transfer of the Province back to the Crown for £12,000, "because of debts contracted for settling and improving the colony." The proposed sale was not consummated. After 1727 Penn's heirs realized handsomely on the property.

LAND POLICY OF THE COMMONWEALTH

At the close of the Revolution the young Commonwealth immediately gave consideration to the disposal of its remaining public land. On April 9, 1781, a law was passed establishing a Land Office and giving those to whom patents had been issued under the proprietaries an opportunity to validate their titles. The Act provided that if payments then due on such lands were not made before April 10, 1787, the lands would be sold for arrearages. Many were unable to meet this requirement.

On July 1, 1784, unsold public land in the purchase of 1768 was thrown open for settlement. Warrants of survey were issued for any location the applicant might choose. The amount of land that could be obtained on a single application was increased from 300 to 400 acres, plus a six per cent allowance for error in the survey. The price was £10 per 100 acres, provincial currency, or about thirty-three cents an acre. In addition, the applicant paid the cost of the warrant of survey and the patent. Few sales were made; the price was too high.

The purchase of 1784, east of the Allegheny River, was confirmed by the treaty of Fort McIntosh (Beaver) in 1784. In January 1785 the Land Office was opened for sale of tracts in this area. Warrants were issued for a maximum of 1,000 acres per application with an over-run of ten per cent, in addition to the usual six per cent allowance for error in the survey. This is why most warrants were for 1,160 acres. The land was sold by lottery; numbered tickets, one number for each application, were placed in a lottery wheel. These "lottery warrants" were numbered in accordance with the outcome of the spinning of the wheel.

There were few sales; the price set, £30 per hundred acres, was too high. Only a few of the choicest tracts were purchased. On October 3, 1788, the price was reduced to £20 per hundred acres. This, also, was more than most settlers could pay.

On April 3, 1792, a general land law was passed.[50] The state still had much land to sell and was sorely in need of funds. After soldiers of the Revolution had been cared for by the allocation of Depreciation and Donation Lands there was left about two thirds of the West Allegheny District and nearly all of the Purchase of 1785 east of the Allegheny. The price of land in the West Allegheny District was set at about twenty cents an acre; in the East Allegheny District at about thirteen cents an acre. This drastic reduction in price brought immediate results. Between 1792 and 1794 more than 5,000 warrants were issued, covering about 5,000,000 acres.

One of the first acts of the new state government was to redeem its pledge to those who had served in the Pennsylvania Line. During the war they had been paid in greatly depreciated continental paper currency. To off-set this loss they had been issued "certificates of depreciation," showing the additional amount to which they were entitled had they been paid in hard money. These certificates were to be accepted as equivalent to specie when offered in payment for public land.

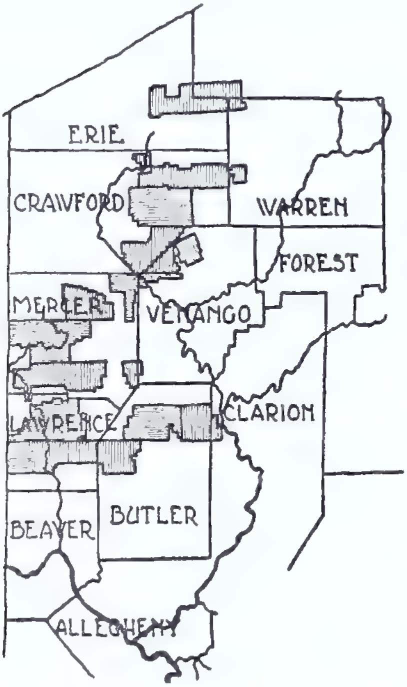
On March 12, 1783, the Legislature provided for the sale of certain public lands to redeem these certificates and set aside a tract of 1125 square miles between the Ohio and Allegheny rivers for this purpose. These "Depreciation Lands" comprised parts of the present counties of Allegheny, Armstrong, Butler, Beaver and Lawrence. Indian titles to this area were not extinguished until January 1785. The survey was completed in 1789. Sales to veterans, by auction, began in November 1785 after part of the survey had been completed, and continued until March 1787. By that time about half of the 720,000 acres had been disposed of at an average price of twenty-eight cents an acre. Most of the best land was secured by speculators who bought certificates of depreciation from veterans at a discount. There were few settlers; after sales were closed, Scotch-Irish immigrants squatted on much of the area and eventually secured preemption rights to their claims.

By Act of Assembly on March 7, 1780, "certain donations and quantities of lands" were set aside for Pennsylvania veterans to be surveyed and allocated at the close of the war as a soldier bonus. The Act of March 23, 1783, extinguished all rights and titles to these lands other than for this purpose and set aside an area of 616,000 acres north of the Depreciation Lands. This comprised parts of the present counties of Armstrong, Butler, Forest, Lawrence, Venango and Warren, Mercer and Crawford counties and part of Erie County which lies south of the triangle. It then was an almost unbroken wilderness.

The tracts were numbered and awarded by lots as drawn from a lottery wheel. Veterans acquiring donation land were exempt from paying taxes on it during their lifetime. More and better land was awarded to officers than to privates; a private received 200 acres, a major general 2,000 acres. This procedure was a source of much irritation. Sales continued until March 31, 1845, when the remaining unassigned land was opened to the general public.

Donation Lands, like Depreciation Lands, did not meet the expectations of the Legislature. Only about 3,000 veterans received patents and many of these promptly disposed of their land to speculators at a low price. There was little actual settlement on the area.

With the close of the last Indian War, in December, 1795, the border became safe for settlers. The time had come to conquer the last frontier.



Location of the Donation Lands set aside for Pennsylvania Revolutionary War veterans in 1783.

The older settlements in the eastern parts of the state were becoming too "crowded" for adventurous spirits. New England farmers also were beginning to feel the pinch of soil depletion and turn their eyes westward toward virgin land.

The land act of 1792 was an iniquitous piece of legislation. Obviously it was a compromise between representatives in the General Assembly of the rich and conservative East and of the poor and democratic West. Albert Gallatin of Pittsburgh was leader of those who hoped to see these public lands sold at a low price to *bona fide* settlers only, not to speculators. Eastern capitalists, however, thought they saw an opportunity to make large profits. The law was full of "jokers" designed to protect the interests of speculators.

This Act introduced a new and trouble-making policy; land would be sold not only to those who would "cultivate, improve and settle" upon it but also to those who would "cause the same to be cultivated, improved and settled." [51] Title was not to pass unless the settlers had, within two years, "made or caused to be made an actual settlement thereon, by clearing, fencing, and cultivating at least two acres for every hundred acres contained in one survey, erecting thereon a messuage for the habitation of man, and residing or causing a family to reside thereon, for the space of five years next following his first settling of the same, if he or she shall so live." The 'weasel words' were "cause to be made."

The wording of the act would seem to imply that land was to be sold only in small tracts, but the reverse was true. The amount that could be secured under one application was limited to 400 acres; with over-run, 430 acres; but an individual could make any number of applications. Thousands of warrants were taken out by speculators, operating either as individuals or as a company. They made application under many names, real or fictitious, including the numerous progeny of John Smith. Acquaintances were induced to make application under their own names; later these were made over to the speculators by "deeds poll."

A further incentive to chicanery was the provision of the Act that if the grantee was prevented "by force of arms of the enemies of the United States" from making settlement he was entitled to the same rights "as if actual settlement had been made and continued." Indian hostilities began in 1793 and ended in 1795. Speculators hastened to take advantage of this provision. They contended that the war exempted them from complying with the settlement requirement and that now they could secure title to their holdings without "causing it to be settled." This clause was a prolific source of uncertainty as to validity of titles, not only to the great land companies but also to settlers of small means who had taken up land before Indian hostilities began and were forced to abandon their holdings temporarily while the red men were on the war-path.

At first the Board of Property, which administered state lands, ruled that the requirement of settlement was merely postponed two years by the Indian war, not abrogated. This decision threw the big holding companies into a panic. They realized that they could not possibly "cause settlement" to be made on all their numerous 430 acre tracts within two years and thus qualify for patents. So they resorted to politics. They brought such persuasive influence to bear on the Board of Property that in 1797 this pliant body reversed its ruling of 1795 and began to issue patents to land companies and others who presented "prevention certificates." This policy prevailed until 1800 when a new state administration came into power and Tench Coxe was appointed chairman of the Board. He not only refused to issue any more patents on the basis of the presentation of prevention certificates but attacked the validity of those already issued.

The great land companies now saw their dream of easy money fading away. They petitioned the Supreme Court of Pennsylvania for a mandamus to compel the Board of Property to grant patents on the presentation of prevention certificates, but the Court ruled against them. The Pennsylvania Population Company, a state corporation, then began to compromise; but the Holland Land Company, a foreign corporation, carried its case to the United States Supreme Court. In 1805 that tribunal reversed the decision of the State Supreme Court, holding that the settlement requirement of the Act of 1792 had been abrogated by the Indian War, not merely postponed two years.

These conflicting and quickly changing legal rulings left *bona fide* settlers in a state of demoralization. Those who had settled under warrant from the state, after the Board of Property had declared the claims of the land companies invalid, formed organizations to protect their interests. Whatever the interpretation of the law might be at the moment, they felt that actual settlers and improvers, not speculators, should be given preference. They suspected that the courts were inclined to place property values above human values. When it was announced that the highest court in the land had upheld the claims of the speculators, they were bitterly resentful. Many moved elsewhere, mainly to Ohio and other prairie states. The land companies then adopted a policy of compromise but it was too late. Prolonged uncertainty as to validity of title and greed of land companies retarded the development of northwestern Pennsylvania for more than a quarter century.

LAND SPECULATORS

The consummate flower of land speculation in Pennsylvania bloomed from 1790 to 1805. Such an orgy of gambling in realty rarely has been witnessed elsewhere. Fortunes were made and lost by frenzied promotors bringing, as usual, distress to thousands of innocent by-standers, including many farmers who were caught in their glittering web.

The premier land speculator of his time, if not of all time, was John Nicholson of Philadelphia. After his death in 1800 his brother Samuel reported to state officials that the lands which John Nicholson controlled comprised 3,700,000 acres, or about one seventh of the state. Nicholson was in a particularly favorable position to manipulate land deals, being Comptroller-General from 1782 to 1796. As such he had advance information on the sale of public land and could make application before others. It was charged that he used public funds to make personal land purchases. Robert Morris and James Greenleaf were his principal associates.

Nicholson formed several joint-stock land companies to which he conveyed a large part of his holdings. Soon after the passage of the Act of 1792 he applied for 250 warrants, or 100,000 acres, on Beaver Creek and organized his first holding company, the Pennsylvania Population Company. This company secured many more warrants. In December 1792 he sold his rights in 500,000 acres to the Holland Land Company for two and a half shillings an acre and gave that company an option on 200,000 acres more, which option was exercised. Two years later Nicholson sold the same group of financiers 200,000 acres more. Shares in his wildcat companies were eagerly bought by a land hungry public.

Ultimately, the affairs of Nicholson became so involved and his finances so embarrassed that he was unable to withdraw his warrants from the Land Office to have the tracts located and surveyed. His multi-million dollar bubble burst in 1795. He died in 1800, in prison and bankrupt. His unpaid debts amounted to the staggering sum of $12,000,000. Stock holders of his company had to foot the bill. Thousands of land titles were rendered invalid. The state established a "Nicholson Court" with plenary powers to settle conflicting claims; forty years were required to clean up the mess.

As the masterly financier of the Revolution, Robert Morris occupies a secure niche in the patriot Hall of Fame, but his talents were applied to questionable practices thereafter as an associate of John Nicholson. About 1793 he promoted the Ceres Lake Company which controlled 300,000 acres, mainly in McKean and Potter Counties. Capital for the enterprise was supplied by exiled French nobility who had fled at the outbreak of the French Revolution. John J. Keating, an Irish soldier, was Manager of the Company; later he became identified constructively with the development of northwestern Pennsylvania.

Morris invested heavily in the stock of John Nicholson's land companies and induced many of his friends to do so. In 1794 he purchased

1,000,000 acres on Loyalsock Creek for re-sale to the Asylum Company as a haven for French nobility. In the same year he sold the Pultsney Company of London about 1,000,000 acres, realizing about three times what he had paid for the land. He also sold 1,500,000 acres in the "Genesee country," New York, to a group of Amsterdam capitalists later known as the Holland Land Company. He organized the North American Land Company, with holdings mostly in New York but partly in Pennsylvania.

The association of Morris with Nicholson was his undoing. When Nicholson's land empire collapsed, he was jailed for complicity in shady deals.

A number of other prominent citizens were victims of land fever. James Wilson of Philadelphia, Associate Justice of the United States Supreme Court, was seriously implicated. In 1793 he acquired about 500,000 acres which he sold to the Holland Land Company. He was a heavy stock holder in Nicholson's notorious Pennsylvania Population Company. Thomas McKean, Governor of Pennsylvania, acquired 300,000 acres in the western part of the state. William Bingham was a very large purchaser of land in the Erie Triangle; he finally sold it to the Holland Land Company. Henry Drinker, Tench Francis, and Robert Rose each secured 100,000 acres or more in Susquehanna County. Benjamin Chew, Archibald McCall, James D. LeRoy and John Vaughan also were large investors. Most of the speculators lived in Philadelphia.

In 1810 a contemporary asserted, "Every great fortune made in Pennsylvania during the past fifty years has been from land." This was not strictly true; but even if it were, the reverse also was true—that more money was lost than made in land speculation. At that time land was regarded merely as a source of personal gain, not as a public asset. Politicians and capitalists were expected, as a matter of course, to acquire great tracts of public land for re-sale at a high profit. Even city people of limited means invested their meager dollars in land. This was but one aspect of the fever which swept the country after the organization of the Federal government. Speculation was rampant in other glittering investments as well as in land. Fortunes were made by a few but most investors drank the bitter cup of loss.

Of the numerous land companies organized during this hectic period the Holland Land Company was the largest and most cordially hated. In 1792 a group of Amsterdam bankers purchased from James Wilson 499,660 acres east of French Creek and Allegheny River. This tract was in the East Allegheny District and comprised what are now parts of Potter, McKean, Cameron, Elk and Jefferson counties. A large portion of it was rough land and practically worthless at that time. The purchase price was three shillings four pence, about forty-five cents an acre.

The Holland Land Company did not exist as such until it was incorporated in Holland on February 13, 1796; earlier land purchases were in the name of "Wilhelm Willick and others." The American agent of the Company was Theophile Cazenove whose "Journal" is one of the best sources of information on Pennsylvania rural life during this period. The Company sold stock in Holland; when it collapsed these small investors, rather than the promoters, were the chief losers.

The Company added to its holdings until it owned more than 1,500,000 acres, partly in New York. In December 1792, it bought 500,000 acres from John Nicholson at two and one half shillings an acre. A little later it bought 200,000 acres more from the same promoter. It also purchased 1,000 of the 2,500 shares of the Pennsylvania Population Company organized by John Nicholson. Later the holdings of that company were incorporated with those of the Holland Land Company, but disputes about titles forced the dissolution of the merger.

The disastrous failure of the Nicholson-Morris-Greenleaf triumviate in 1795 marked the beginning of the collapse of the "boom" in wild lands. Cazenove realized that he could no longer hope to dispose of the property in large tracts. He then set up an organization for sales in small tracts. He commissioned sales agents at various points throughout the East and set up headquarters at Batavia, N. Y., which was near the center of his domain. Many farmers were induced to leave New England and New York and move to Pennsylvania.

After its victory in the United States Supreme Court in 1805 the Holland Land Company became the object of intense popular hatred. The controversy between the land companies and settlers became a burning issue throughout western Pennsylvania. The prolonged period of litigation and uncertainty as to validity of titles undermined public confidence in land deals so that the Company had great difficulty in finding purchasers. In 1810 it disposed of its remaining holdings at a heavy loss.

By 1820 most of the public land of Pennsylvania had passed into the hands of private citizens. By that time, also, some order had been evolved from the chaos of land titles and transfers inherited from the Penn regime. For the first time a land owner could ascertain from the Land Office whether there were other claimants to his property and a prospective purchaser could satisfy himself as to the validity of the title.

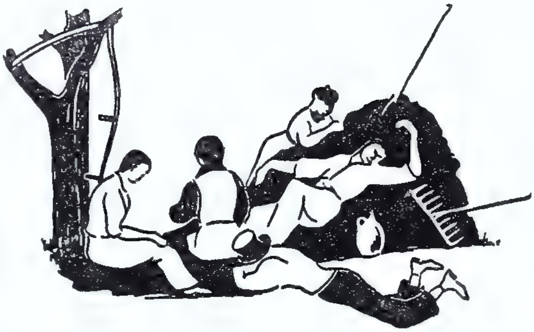
A dispassionate review of the public land policy of Pennsylvania can lead to but one conclusion—it is not a creditable record. It was marred by lack of system, vacillation and greed. Penn's rich woodland was exploited not for public interest but for private gain. In 1822 Nicholas Biddle appraised the record in these stinging words:

"If, when the state sold its vacant lands, they had been previously surveyed and marked . . . they would have been cheerfully bought and easily settled; but the unfortunate policy of selling the right to land (by warrant, without survey) introduced a fatal spirit of speculation and fraud which thirty years have not completely repaired. Entire families were ruined by the madness of these delusions. In the inextricable confusion of interfering claims the same lands were sold again and again, by fraud or ignorance, till the map of some of our counties exhibits a mosaic of conflicting surveys. . . . Men abandon in dispair the attempt to settle on lands so surrounded with uncertainty and trouble . . . I have known as many as four claimants to the same land." [52]

The greatest natural resource of Pennsylvania is her land; for three centuries this has been the chief source of her wealth. Pennsylvania farmers love their land; many families have clung to it through successive generations. A large number of farms, especially of Pennsylvania Germans, now are operated by direct descendents of pioneers who carved them out of the wilderness. The titles to these farms, passed down from father to son, reach back to original patents from William Penn. This is the beginning of a permanent agriculture.

Giant chestnut tree,
Bucks County,
1840

II



THE FARMERS

THE FIRST farmers of Pennsylvania were Indians; their food came from the soil as well as from the chase. The Lenni-Lenape, or Delawares, with whom the first settlers dealt, were an agricultural people. Like all Pennsylvania tribes, however, they were nomads; rarely did they live longer than twenty-five years in the same place, mainly because of soil exhaustion by continuous cropping with corn and increasing difficulty in securing game and firewood close at hand. The first settlers were indebted to Indians for many agricultural practices that helped them to become adjusted to the new environment.

It is estimated that the number of Indians in Pennsylvania at the time of William Penn did not exceed 15,000. By 1790 these had been reduced to 1,300, located mainly on the north branch of the Susquehanna. Most Pennsylvania Indians were of the Algonquin family, of which there were many tribes. Those who inhabited the Delaware River basin were the several branches of the Lenni-Lenape; after 1664 they were called Delawares by the whites. The Nanticokes, another tribe of the Algonquin family, lived in the upper Susquehanna Valley.

Other tribes were the Shawanese or Shawnees, who occupied part of Lancaster County and westward; the Conestogas, remnant of the once mighty Susquehannocks, who were shamefully exterminated by the "Paxton Boys" in December 1763; the Tuscaroras in the central part of the state; and the Wyandots and Eries in the northwest. At the time of Penn all Pennsylvania Indians were submissive to the Iroquois, or Mengwe, who were known to the whites as the Five Nations, later the Six Nations, with headquarters at Onondaga, New York. All treaties and land purchases after the first two were made with the Iroquois, not with local tribes.

INDIAN AGRICULTURE

The agriculture and diet of Indians were limited. In 1683 William Penn reported to friends in England, "Their diet is Maize, or Indian Corn, divers ways prepared: sometimes Roasted in the Ashes, sometimes beaten and Boyled with Water, which they call *Homine;* they also make Cakes, not unpleasant to eat; They have likewise several sorts of Beans and Pease that are good Nourishment; and the Woods and Rivers are their Larder." [1]

In 1692 Richard Frame described Indian life in this burst of poesy:

> Those that were here before the *Swedes* and *Finns,*
> Were naked *Indians,* clothed with Skins.
> They take no care to plow, nor yet to sow,
> Nor how to till their Land they do not know.
> Their care for Worldly Riches is but light;
> By day they hunt, and down they lay at night.[2]

Pastorious, a much more careful observer, reported: "They plant Indian corn and beans about their huts, but they take no thought for any more extensive farming and cattle raising; they are rather astonished that we Christians take so much trouble and thought concerning eating and drinking, and also for comfortable clothing and dwellings, as if we doubted that God were able to care for and nourish us."[3]

Peter Kalm added his observations to the evidence that Indians were poor farmers: "Corn and some varieties of beans and melons comprised almost the whole of Indian agriculture and gardening; and dogs were the only domestic animals. But as their agriculture and gardening were very trifling, and they could hardly live two months in a year upon their produce, they were forced to resort to hunting and fishing, which furnished their chief substance; and they also in part rely on the products of wild plants and trees." [4]

Among wild plants used by Indians as food the ground nut (*Apios tuberosa*) was most important. The roots were roasted. A marsh plant called Taw-ho *(Arum)* also was used freely. Other wild food plants were huckleberries, choke-cherries, plums, strawberries, blackberries, raspberries, dewberries, gooseberries, cranberries, elder-berries, mulberries, grapes, persimmons, crab-apples, paw-paws, black walnuts, butternuts, chestnuts, chinquapins, hickory nuts and acorns. Wild peaches were abundant in the Delaware Valley. Chestnuts were dried, ground into flour and made into bread. Many fruits were dried for winter use.

Indians practiced agriculture only to supplement food secured from forest and stream. In March, April and May, when fish, especially shad, were moving up-stream freely, they depended largely upon the product of their weirs. June and July brought various kinds of berries to supplement meat from the spring hunting expedition. Roasting ears and tree fruits, especially peaches and plums, together with a few garden vegetables comprised a large part of their diet during August and September. October and November brought nuts, wild fowl and meat from the fall hunting expedition. From December to March stored corn, beans, nuts, dried fruits, and fresh, dried or smoked meats were the main diet.

Indian agriculture was wholly crop production; they had no domesticated animals but dogs, which were eaten when food was very scarce. Practically all labor in the fields was by women; Champlain called squaws "the Indian's mules." Probably Indian agriculture was a degenerate form of Mexican agriculture whence had come their main crops—corn, beans, pumpkins, squash and tobacco. It could not advance much without livestock.

Indian agriculture was closely associated with their religion. Every tribe observed one or more seasonal religious festivals, as the Maple Festival, Planting Festival, Strawberry Festival, Green Corn Festival, Harvest Festival. At the Planting Festival petitions were addressed to the Great Spirit for a bounteous harvest. At the Green Corn Festival acknowledgment was made to the deity for the gift of corn. The period of tribal rejoicing often lasted several days.

The villages were located on river bottom land not only because of abundant water and fuel supply and convenience of transportation but also because the soil was likely to be fertile and less subject to drought. Moreover, game usually was plentiful there.

A village consisted of ten to fifty families. It was surrounded by a belt of crop land, usually with girdled and dead trees standing in it. Peter Lunderström, who surveyed the Delaware in 1654, said that on the west side of the river opposite Asinpunck (Trenton) and along the lower reaches of the Schuylkill were large Indian corn fields. The crop land of a village commonly comprised twenty to 200 acres. South of Pennsylvania a larger acreage was cultivated; Shannon states, "Many fields of hundreds of acres are known to have existed and at least one Indian village in Virginia had no less than 3,000 acres of cleared land, much of it in corn." [5]

Indian farming was individual, not communal. Ordinarily a family cultivated one to one and a half acres of corn and harvested forty to sixty bushels. Theft of corn was rare; in some tribes this was a crime punishable by death.

Clearing and cultivating land was exceedingly laborious work. Indians were not acquainted with the use of iron; they were forced to use tools made of wood, sharp stones, shells, the claws of wild animals and pieces of bones. A tomahawk (hatchet) was used to deaden trees by girdling. This was a wedge-shaped piece of flint or horn-stone inserted into the end of a split stick and bound in with rawhide thongs. Several days were required to sharpen this crude tool by rubbing the edge against other stones. Large trees were felled by setting fire to brush piled against the trunk; when a crust of charcoal formed, this was chipped off with a tomahawk and the burning process repeated many times. Usually trees were merely girdled to kill them and left standing several years until seasoned, when they were burned down. Brush was grubbed out with heavy mattocks or hoes made of hardwood or by tying the shoulder-blade of an elk or bear to a stick with rawhide thongs.

Fewer plant diseases and insect pests preyed upon the limited acreage of Indian crops than upon the great crop areas of today, but there were no effective control measures. The red men thought that pests were sent by evil spirits as penalty for wrong-doing on their part. Incantations of medicine men were potent against a scourge of caterpillars only when the time had come for them to disappear naturally by pupation. Cut-worms were very troublesome on new ground.

Birds and rodents, particularly crows, took heavy toll, especially of corn. Scare-crows were used, but with indifferent success. More commonly a small shelter was built on a raised platform in the middle of the corn field for the use of watchers. Rarely were crows killed because of the tradition that a crow brought the first grain of corn to Indians from the great god Kautantauvit.

Indians made considerable progress in the culture and breeding of their staple crop, corn. In the course of many centuries they had developed varieties adapted to different climatic conditions and for different purposes. They had early and late ripening varieties of field corn, pop corn and sweet corn. Varieties grown in Canada matured in less than ninety days and were only four or five feet high; varieties grown in the South required five months to mature and were ten to twelve feet high. On new ground the yields were forty or more bushels an acre.

Indian corn culture in New England as described by Jeremy Belknap is representative of the practice in Pennsylvania: "The manner of Planting is in Rows, at equal distance every way, about 5 or 6 feet. They open the Earth with the Howe, taking away the surface 3 or 4 inches deep, and the bredth of the Howe, and so throw in 4 or 5 Granes a little distant one from another and cover them with Earth. If two or three grow it may do well, for some of them are usually destroyed by Birds or Mouse-Squirrels.

"The Corne grows up an hand's length, they cut up the Weeds and loosen the Earth about it with a broad Howe, repeating this labour as the Weeds grow. When the Stalk begins to grow high they draw a little Earth about it; and upon the putting forth of the Eare, so much as to make a little Hill, like Hop-Hill. After this they have no other business about it till Harvest.

"The Natives commonly Thresh [husk] it as they gather it, dry it well on Mats in the Sun and then bestow it in holes in the Ground (which are their Barns), well lined with withered grass and Mats, and then covered with the like and over all with Earth; and so its kept very well till they use it." [6]

In southeastern Pennsylvania beans were planted in corn hills after the corn was several inches high; the vines climbed up the stalks. Between the corn hills squashes and pumpkins might be grown to advantage, especially on rich ground, since the hills were five to six feet apart. Successive plantings of corn were made in April, May and June in order to have a succession of roasting ears. In preparing land for corn only the soil of the hills, which were twelve to twenty inches wide, was stirred; the interspaces were not broken. The same hills were used in successive years; eventually they became mounds of considerable height since soil was drawn up around the stalks every year. There was no inter-tillage; wild growth was pulled up or chopped off.

At harvest time seed corn was selected from stalks bearing the largest and best ears and hung up in wigwams. The remaining ears were dried in the sun or over smouldering fires, usually with husks on. At night they were covered with mats to protect them from dew. When dry, the ears were husked, shelled and the kernels placed in bark or willow baskets. Corn needed for winter consumption was stored in small pits dug in well-drained soil, each holding eight to ten bushels. They were five to six feet deep and were lined with bark or dry grass.

Sometimes corn was stored on the cob. Peter Kalm records: "The ears of corn were thrown into the hole and covered to a considerable thickness with grass; and the whole covered with a sufficient quantity of soil. Corn kept extremely well in these holes and each Indian had several subterranean stores where his corn lay safe, though he travel far from it." [7] Sometimes squaws found it necessary to conceal the location of these storage pits from the braves, who were tempted to eat prematurely grain stored for winter use.

Kidney beans were next to corn in importance as a food crop. They were of several climbing varieties. When meat was scarce beans were the principal protein food. They were grown mostly in corn fields, sometimes in gardens.

Summer squashes, pumpkins and watermelons were grown in interspaces of corn fields. The squashes were warty yellow crooknecks and greenish-white patty-pans. The word squash is a contraction of the Indian name "squontersquash." Winter squash was not known. Pumpkins were a favorite dish. Says Pastorius, "I once saw four Indians take a meal together in hearty contentment and eat a pumpkin cooked in clear water, without butter or spice. Their table and bench was the bare earth, their spoons were mussel-shells with which they dipped up the warm water; their plates were the leaves of the nearest tree, which they do not need to wash with painstaking care after the meal nor to keep with care for future use." [8]

Sometimes sunflowers were grown in corn fields as an inter-crop; the seeds were eaten raw, roasted and added to corn and bean soup, or ground and made into bread. Other minor food crops were Jerusalem artichoke, muskmelon, pepper, and sweet potato. Gourds in great variety were grown for use as dishes, bowls, jugs, dippers, ladles, spoons.

Maple sugar making, an important factor in pioneer life, was derived from Indians. As recorded by Samuel Hopkins, "They cut the Tree on one side in such a Form that the Sap will naturally gather into a small Channel at the Bottom of the Hole cut; where they fix into the Tree a small Chip of six to eight inches long which carries the Sap off from the Tree into a Vessel set to receive it."

Indian braves considered tobacco smoking essential to health. It was a feature of religious ceremonies and political councils. Indians gave practically no care to tobacco except to chop out weeds and remove suckers. Seed was sown in the pulverized soil of a small garden apart from the corn field; sometimes vegetables were grown in this garden, also. The plants were not topped but were allowed to run to seed. When the leaves began to ripen, the plants were pulled and dried in the sun or by a fire. Both stalks and leaves were crumbled together for smoking.

Roasting ears were highly prized. "Succotash" ruled at the Green Corn Festival; this was corn, beans, squash and chopped fat meat of dog cooked together. The whites adopted succotash but left out squash and substituted pork for dog. Dried corn was soaked for ten or twelve hours, pounded into coarse meal in a mortar, mixed with hot water, kneaded and rolled into cakes which were boiled or baked in hot coals with lives ashes over them; these "appones" are the pones of today. Corn also was boiled to loosen the hulls; this hulled corn was called "hominie."

Grinding corn was very laborious. Daniel Falckner describes the common method: "A piece of hewn tree, or one which still stands fast with its roots in the ground, is used. In the middle of this they burn a hole like a deep bowl or mortar. In this they pound their Indian corn, whereby they make bread, which they call *Ponn.*" [9] Sometimes corn was ground in stone or wooden mortars with a stone pestle about a foot long and four inches thick. When Indians first saw the windmills erected by the Swedes they were astounded and fearful. "They came in numbers," says Peter Kalm, "even from the most distant parts, to view this marvel, and would sit for days staring at it. They were long of the opinion that it was not driven by the wind but by spirits who lived within it." [10]

Indians had a method of charring corn so that it would keep for years. The ears were pulled before fully ripe, roasted in hot ashes and the kernels shelled off and dried in the sun. After adding about one third as much maple sugar by volume the corn was pounded into fine meal. On long expeditions this "nocake" (modern version, hoecake) or "nookick" was carried in leather bags. Three or four spoonsful mixed with water or snow were thought to suffice for a meal.

Indian farmers have long since ceased to harvest crops from Pennsylvania soil, though a pitiable remnant of the once proud Seneca tribe, of the mighty Iroquois Confederacy, still lives on the Cornplanter Indian Reservation in Warren County. In 1791 this reservation of 860 acres was granted by the General Assembly to the great Seneca chief, Cornplanter. There the state erected to his memory, in 1866, a marble shaft eighteen feet high, the only memorial of this type to an Indian in the United States erected with public funds. It bears this inscription: "Distinguished for talent, courage, eloquence, sobriety and love of tribe and race, to whose welfare he devoted his energies and means during a long and eventful life."

Pennsylvania farmers are indebted to Indians for these important crops and practices: (1) Corn, the premier crop of the state, next to grass; (2) Methods of storing corn, the open-slat crib set upon posts was used by southern Indians; (3) Tobacco, beans, squashes and pumpkins; (4) Methods of clearing land; (5) Maple sugar making; (6) Woodcraft—trails which blazed the way for white settlement.

Many Pennsylvania towns, mountains and streams bear Indian names; these are mute witnesses of a race that once possessed the land. The ashes of their last council fire in Penn's Woodland have been cold for more than a century.

THE COLONIAL MELTING POT

Pennsylvania was the melting pot of colonial America. The pre-eminence of Pennsylvania in agriculture during the colonial period and the early years of the republic was due in large measure to the diverse nationalities that comprised her population. This was in sharp contrast to some other colonies, as Virginia and Massachusetts, which had a comparatively homogenous group of one tongue and one religion. Coming from different parts of the Old World, Pennsylvania pioneers brought different agricultural techniques; these were perpetuated in their new home.

William Penn sought to attract to his province, most of all, industrious, God-fearing men of the soil, "those persons that Providence seems to have most fitted for Plantations. . . . Men that have an eye to the good of Posterity, and that both understand and delight to promote good Discipline and just Government among a plain and well-intending people."[11] Pennsylvania was not used by the mother country as a dumping ground for paupers and criminals; a majority of the settlers were farmers and skilled craftsmen who were well equipped to cope with the hazards and toil of pioneer life. In their new environment European "peasants" soon became independent American farmers.

Diversity of tongue, religion and political viewpoint was not without embarrassments. In 1796 George Washington expressed himself forcibly concerning certain elements in the young Commonwealth: "Pennsylvania is a large state; and from the policy of its founder and of the government since, and especially from the celebrity of Philadelphia, has become the general receptacle of foreigners from all countries and of all descriptions, many of whom soon take an active part in the politics of the state; and coming over full of prejudice against their government—some against all governments—you will be enabled without any comment of mine to draw your own inference of their conduct."[12]

Practically all the early immigrants became farmers. They were mostly of three ethnic groups—English, Germans and Scotch-Irish. Minor groups were Dutch, Swedes, Finns, Welsh, French, Irish, Scotch. The three major groups were sharply differentiated in national characteristics, religion, culture and traditions. In general, each group located in a separate section of the state and sought to perpetuate its own culture and traditions—the English near Philadelphia, the Germans in south-central Pennsylvania and the Scotch-Irish farther west. So sharp was the line of demarcation between these three sections that in colonial days there were, in many respects, three Pennsylvanias, not one.

William Penn was a master salesman. He published about forty pamphlets in different languages setting forth in glowing terms the advantages of life in Pennsylvania. These were distributed in the countries of western Europe. In one pamphlet he gives the estimated expense which a man who had £100 would incur if he bought 500 acres and moved his family—wife, child and two indentured men servants—to the New World. The party, he said, should plan to arrive in the spring and camp out the first summer. The men could build a log cabin, clear fifteen acres of land and sow it to winter grain before cold weather. During the winter they could build a barn and clear more land. The following spring livestock could be purchased from the Swedes. Penn, the promoter, presents the following anticipated balance sheet of this settler for the first year:[13]

Planter Debitor

	£	*s.*	*d.*
To Passage and Cloaths	38	.02	.06
To House and Barn	15	.10	.00
To Provisions for one Year	17	.17	.06
To a Stock in Cows, Oxen, Swine and a Mare	24	.10	.00
	96	.00	.00

Per Contr. Creditor

	£	s.	d.
Crops valued at	59	.10	.00
House and Barn, value	30	.00	.00
Stock, cost	24	.10	.00
Land, with 15 acres improved	26	.05	.00
Remaining cash (of the 100 £)	4	.00	.00
Total	114	.05	.00

Thus, according to Penn, the colonist would have a very satisfactory year—on paper. No wonder ships sailing westward from Europe were loaded with hopeful immigrants.

THE DUTCH

The first white farmers of Pennsylvania were Dutch. Most of the early Dutch, however, were traders rather than farmers; they were more interested in buying furs from Indians than in tilling the soil, but some were farmers in a desultory way.

The first permanent settlement of Dutch in Pennsylvania occurred in 1659 at Minisink Flats, a few miles northeast of the present site of Stroudsburg. They raised crops, planted apple trees and opened mines. They bought land from the Indians with whom they lived at peace until 1755. Minisink (Meenesink, Minisincks—"the water is gone") was the second permanent European settlement in Pennsylvania. For many years the English at Philadelphia did not know of its existence. The Dutch, however, did not take root on the Delaware. When the English came into possession of the river, in 1664, there were not more than a hundred Dutch in the entire valley.

That the early Dutch traders on the Delaware did intend to do some farming is evidenced by the lading of the *Walrus,* which arrived from New Amsterdam (New York) in the spring of 1631. It carried, among other supplies, a number of cattle for the New Jersey colony of Dutch on the banks of the Horn Kill. It is recorded, "They engaged in whaling and farming . . . so that in July of the same year their cows calved and their lands were seeded and covered with a fine crop." This settlement was wiped out by Indians.

After the organization of the Quaker commonwealth a number of Dutch who were dissatisfied with conditions in New York settled in Bucks and neighboring counties, mainly between 1690 and 1715. They purchased land from William Penn and became industrious and successful farmers. The Dutch were particularly interested in dairy farming, especially the farm manufacture of cheese. William Penn spoke appreciatively of them as "people proper and strong of Body, so they have fine Children, and almost every house full; rare to find one without three or four Boys and as many girls; some six, seven and eight sons."[14]

Dutch names—Van Horn, Van Pelt, Van Dyck and others—still appears on rural tax rolls in southeastern Pennsylvania. By 1750, however, few spoke Dutch and that nationality had mostly merged with the more numerous Swedes, English and Germans by inter-marriage. Thus Dutch traits of industry, stability and business acumen were perpetuated in this state.

THE SWEDES

"The first planters in these parts were the *Dutch;* and soon after them the *Swedes* and *Finns.* The *Dutch* applied themselves to *traffick;* the *Swedes* and *Finns* to husbandry."[15] This succinct statement by William Penn in 1683 is a fair appraisal of the two groups. Swedes and Finns loved the soil. Finland then was a dependency of Sweden and the two nationalities were closely associated. The whole group, Swedes and Finns, is referred to here as Swedes.

The first permanent settlements of Swedes in Pennsylvania took place on Tinicum Island and at the present site of Chester, in 1643. It was under the able though extremely rigorous administration of Johan Printz, Governor of New Sweden. The colony had an agricultural objective; Printz was instructed by the Swedish Royal Council to purchase from the Virginia colony such cattle and seed grain as he needed in addition to that brought from Sweden; and to "forward agriculture and the improvement of the land, setting and urging the people thereto with zeal and energy." He was specifically directed to promote "immediate culture of grain and other vegetables, to procure a good race of cattle, sheep and other animals" and to produce tobacco, grapes and silk.

Printz carried out these directions with vigor. Land was purchased from the Indians at a nominal price. "The land upon the river De La Ware which Queen Christina purchased of the wild heathen stretched from Cape Hinlopen to the Falls of the Delaware, and thence westward to the Great Falls in the river Susquehanna, near the mouth of the Conewago Creek."[16]

Relations of Swedes with Indians were, with few exceptions, friendly. Printz and his people had been enjoined "to treat them with all humanity and respect . . . and to seek to gain their confidence, and to impress upon their minds that neither he, the Governor, nor his people and subordinates are come into these parts to do them any wrong or injury."[17] Governor Printz, however, felt that Indians should be compelled to embrace Christianity, at the point of the sword if necessary. "Heathen" who would not receive the "only true religion" were to be exterminated. Fortunately he did not have sufficient military force to carry out this plan.

Printz assigned thirty of about 100 men available to produce tobacco at Upland (Chester) and along the Schuylkill. Cattle, hogs and sheep which had run wild under the administration of his predecessor, Peter Minuit, were herded. In 1648, of the seventy-nine men remaining twenty-eight were freemen on farms; the remainder were soldiers and servants. [18]

The political supremacy of the Swedes on the Delaware lasted only seventeen years, from 1638 to 1655, when Peter Stuyvesant, Governor of New Netherland, took possession of New Sweden. In 1665 the Swedes came under English rule. It mattered little to them who were their rulers; they continued to sow and to reap and to multiply livestock. Their needs were simple and could be supplied from their own farms. At that time (1665) there were about 650 Swedes on both sides of the Delaware; they were the most numerous and most substantial element of the population until the coming of William Penn. In 1693 an exact census revealed 188 Swedish families, comprising 942 persons, in Pennsylvania. Their farms extended along both sides of the Delaware and Schuylkill and north of the present site of Philadelphia. The lower part of Berks County was occupied by Swedes at a later date.

The Swedes were a clannish people. For many years they perpetuated their language, religion, and customs though surrounded by other nationalities. Eventually they merged with the more numerous English through inter-marriage. Few Swedes came from the mother country after the overthrow of New Sweden.

The Swedes developed a prosperous agriculture. They raised rye, wheat, buckwheat, corn and tobacco in quantities greater than their subsistence needs. Their surplus cattle, sheep, swine and poultry were eagerly purchased by early English settlers. They made butter, cheese, beer and cider and planted orchards and gardens. In 1683 Thomas Paschall reported that they lived "much at ease, having great plenty of all sorts of provisions. . . . They plant but little Indian corne, nor tobacco; their Women make most of the Linnen cloath they wear, they Spinn and Weave it and make fine Linnen and are many of them curious Housewives; the people generally eat Rye bread, being approved of best by them, but not but here is good Wheat . . . as also good Butter and Cheese." [19]

In 1693, when appealing to Sweden that ministers of their own faith be sent to them, the Swedes appraised themselves thus: "Almost all of us are husbandmen; we plough, and sow, and cultivate the land; and as to our meat and drink, we live according to the old Swedish custom. This country is very rich and fruitful; it produces, God be praised, all sorts of grain; all that we plant and sow gives us plentiful returns, so that we are richly supplied with meat and drink, and we send out yearly to our neighbors on this continent and neighboring islands bread, flour, grain and oil . . . We have good reason to thank the Almighty for daily support." [20] Eric Biörk, one of two ministers sent in response to this appeal, wrote home in 1697, "There are no poor in this country but they all provide for themselves; for the land is rich and fruitful and no man who will labour can suffer want."

Pastorious, a German neighbor, was not so favorably impressed with the farming of the Swedes. Said he, "The old inhabitants are poor agriculturists. Some of them have neither barns nor stables and leave their grain for years unthreshed and lying in the open air; and allow their cattle, horses, cows, swine etc. to run in the woods summer and winter, and so derive very little profit from them." [21] The Swedes did neglect their livestock but the weight of evidence is that otherwise they were good farmers, for their time.

The foundation of Pennsylvania agriculture was laid by the Swedes. English, German and Scotch-Irish settlers who followed and eventually absorbed them could not have become established on the land so quickly without utilizing the experience of pioneer Swedes in crop husbandry and the surplus of their herds and flocks. Swedish family and place names throughout southeastern Pennsylvania are a perpetual reminder of our obligation to these sturdy tillers of the soil.

THE ENGLISH

During the period when the Dutch and Swedes dominated the Delaware they had few English neighbors. The English claimed the Delaware region by virtue of the discoveries of John Cabot in 1498. Between 1623 and 1634 they made a small settlement under a grant from the Crown to Sir Edward Plowden. In "A History of New Albion," published in 1648, is a letter from "Master Robert Evelin" who speaks enthusiastically of "clear fields to plant and sow, and near are sweet, large meads of clover or honeysuckle." This settlement was near the Falls of the Delaware (Trenton). New Albion, however, was soon abandoned.

Another early settlement of English, the "New Haven Colony," was dislodged by the Dutch and Swedes in 1655. In 1664 the English gained control of the Delaware from the Dutch but were not secure in its possession until the treaty of 1674. The administration of the Duke of York followed. Probably there were not more than 100 English settlers on the Delaware at that time. When William Penn arrived, in 1681, there were about 2,000 whites on both sides of the river of whom 500, mostly Swedes, Finns and Dutch, were within the present limits of Pennsylvania.

Penn opened the doors of his province first to English and Welsh Quakers but invited the poor and oppressed of all nations to share the land. English settlers dispossessed some Swedish farmers who were squatters and bought the farms of others. Said Thomas Paschall in 1683, "The River is taken up all along by the Sweads and Finns and some Dutch before the English came, near eight score miles; and the Englishmen, some of them, buy their Plantations and get roome by the great River-side; and the rest get into Creeks and small Rivers that run into it and some go into the Woods seven or eight miles." [22]

Philadelphia was laid out "on the river at Wicacos, a high, dry and pleasant place. The land for it, consisting of three hundred and sixty acres, was given by three brothers of the Swaenson family, upon condition that two hundred acres should be given to each of them in another place . . . with a yearly rent of one half bushel of Wheat for each one hundred acres." [23]

For the first few years after Penn's arrival most of the immigrants were English and Welsh Quakers. By 1685 Philadelphia was a town of 357 houses and the white population of the province was about 7,200. "The people are a Collection of Divers Nations in Europe," reported William Penn in 1685, "as French, Dutch, Germans, Sweedes, Danes, Finns, Scotch, Irish and English; and of the last equal to all the rest." [24] The English came from British colonies and dependencies as well as from Britain. Ultimately they scattered all over the province but were predominant only in the three original counties—Philadelphia, Bucks and Chester, and in the city of Philadelphia. Between 1730 and 1775 German and Scotch-Irish immigrants came in much larger numbers than English but the latter again dominated immigration for a short period after the Revolution.

A group of people of English stock became established in the southwestern part of the state, coming from Virginia, but soon were submerged by the more numerous Scotch-Irish in that area. A much larger group came from Connecticut and other New England colonies and settled in northeastern Pennsylvania. The Connecticut Yankee element was preponderent in northern Pennsylvania as far west as Potter County; that county, together with McKean, Warren, and Erie, was settled mainly by English-speaking people from New York.

Descendents of the Puritans who settled the Wyoming Valley and who survived the terrors of the infamous "Pennamite Wars" still maintain their distinctive traditions and pride of ancestry. Visual evidence of New England influence in northern Pennsylvania is seen in the architecture of farm homes, the "commons" of rural towns and rows of sugar maples lining the roadsides. The Wyoming Valley, however, did not long remain a transplanted bit of New England. Tales of rich virgin land in the Western Reserve of Ohio drew many of the more venturesome young men and women to the West, beginning about 1800. By 1830 this migration was at its height. Henry B. Plumb, a witness of the scene, tells the story: "One of a family, in some cases, kept his ancestral acres until the next generation and then left, until now (1885) there is scarcely one family of the old New England stock left in the township (Hanover, Wyoming County). The Pennsylvania Germans and New Jersey Dutch came in and took the place of the emigrating Yankees for a couple of generations." [25]

Germans did not stay long in the Wyoming Valley—they hungered for limestone soil. Development of the anthracite industry during the first quarter of the nineteenth century resulted in an influx of Welsh, Irish and Scotch; but the dominance of these groups was soon challenged by immigrants from continental Europe—Poles, Lithuanians, Slovaks, Italians. The Wyoming Valley is an outstanding example of successive nationalistic displacement.

Another wave of New England migration occurred soon after 1800. As titles to land in the West Allegheny District began to be cleared, after prolonged litigation, sons and daughters of New England and New York began to settle there. By 1810 the migration trickle had become a stream. All of the northwestern counties were settled mainly by English from New England and New York.

Like the Swedes, the English had a passion for land. Spanish adventurers in Florida and the Southwest were drawn by the magic of the word "gold." The Dutch had attentive ears for the word "beaver." The primary objective of English settlers was to establish homes on the land. As a group, they were good farmers, though inclined, at first, to neglect livestock. They were quick to take advantage of new practices and implements which might improve their farming.

The business aspects of agriculture were highly developed in the English. As time passed many became merchants and tradesmen; they dominated the business and political life of the colony. Philadelphia, the center of English influence, became the industrial, cultural and political capital of the state and nation. In 1792 a French traveller, Brissot de Warville, made this appraisal: "I firmly believe that it is not simply to physical advantages that Pennsylvania owes her prosperity . . . it is to the universal tolerance which has reigned there from the beginning; it is to the simplicity, economy, industry and perseverence of the Quakers which, centering in two points, agriculture and commerce, have carried them to a greater perfection than has been attained elsewhere." [26]

THE PENNSYLVANIA GERMANS

Germans—whose descendents sometimes are erroneously called "Pennsylvania Dutch"—responded quickly to William Penn's hospitable invitation. Soon they became the majority element in Pennsylvania agriculture, as they are today.

Germans came to Pennsylvania for religious, political and economic reasons. Several of the sects had been severely persecuted in Europe. They were part of a great movement of religious conviction called

"Quietism" which spread over Europe toward the close of the Reformation; this produced the Quakers in Britain and numerous sects in Germany. German sectarians held much the same religious views as Quakers —"They are very near the Truth," admitted William Penn. Many were victims of the political and economic ills that left Germany prostrate at the close of the Thirty Year's War in 1648.

It was the original intention of William Penn that only persecuted German sects, not adherents of the Lutheran and German Reformed churches, should come to his province; but after immigration began Germans of all shades of religious belief turned hopefully toward the land of promise. Most of them were tillers of the soil; some were skilled craftsmen. Practically all were poor.

The advanced guard of German immigrants arrived at Philadelphia on October 6, 1683, two years after the landing of Penn. It included thirteen families of "Crefelders," mostly Mennonites, from Crefeld on the lower Rhine. They purchased from Penn 15,000 acres six miles from Philadelphia and there founded Germantown. Their leader was Francis Daniel Pastorius of Frankford, a scholar and man of affairs. He left this record of the pioneer German settlement in the New World:

"I, Francis Daniel Pastorius, with the good will of the governor, laid out another new city of the name of Germantown, or Germanopolis, at a distance of two hours walk from Philadelphia, where there are a good fertile soil and many fresh wholesome springs of water, many oak, walnut and chestnut trees, and also good pasturage for cattle. . . . I have also acquired for my High German Company fifteen thousand acres of land in one piece, upon the condition that within a year they shall actually place thirty householders thereon; and for this reason, that we High-Germans may maintain a separate little province and thus feel more secure from all oppressions." [27]

The settlement prospered; it was joined by many other Germans, some of whom took up land in adjacent areas. For thirty years after the coming of Pastorius, German immigrants were mainly sectarians, of whom Mennonites were most numerous. Most of them settled in Montgomery and Lancaster counties and the valleys of the Schuylkill, Perkiomen and Lehigh. Between 1719 and 1729 a considerable number of Dunkers, a sect of German Baptists, settled in Lancaster County. They were from the Palatinate, a district of Bavarian Germany along the Rhine. In America they were called "Palatinates."

Other German sects seeking haven in Pennsylvania were German Baptist Brethren, who settled mainly in Lancaster County; Moravians from Bohemia, who founded Bethlehem, Nazareth and Lititz; and Schwenkfelders who had been forced out of Silesia by religious persecution. Usually sectarians came in small groups and all of each group settled in the same community. Their pastor was their civil and educational as well as religious leader.

Political tumult in Germany near the middle of the eighteenth century drove great numbers into exile. Mass immigration to Pennsylvania began about 1727 and continued until the Revolution. Some German-speaking immigrants came from Switzerland, Luxemborg, Alsace-Loraine and the Low Countries as well as from Germany. All these became known as "Pennsylvania Germans." They were mostly adherents of the Lutheran and German Reformed churches and were called "church Germans" to distinguished them from the sectarians of earlier immigration.

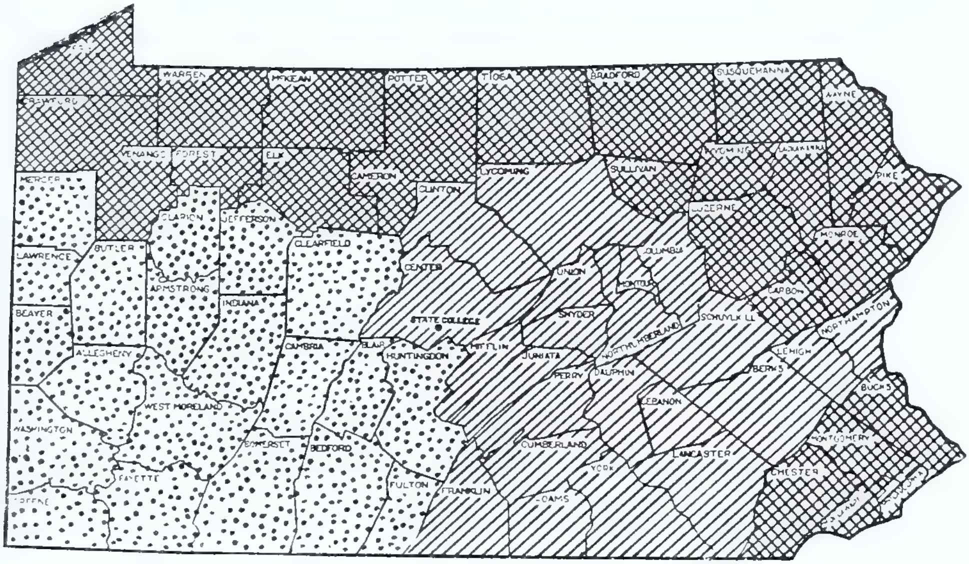
Church Germans settled in Lancaster, Berks, York, Lebanon, Northampton, Lehigh and adjacent counties; eventually they spread throughout southern and central Pennsylvania. Berks County was settled mainly by Germans who came to New York about 1709 but found conditions there unsatisfactory. Beginning in 1723 they floated down the Susquehanna until they reached the mouth of Swatara Creek, up which they made their way and crossed overland to the Tulpehocken. Large parts of Bucks, Montgomery, Carbon, Dauphin, Snyder and Schuylkill counties were settled by Germans. With the passing of years these settlements extended northward into Northumberland, Union and Centre counties and westward into Adams, Franklin, Perry, Juniata and Mifflin counties.

The peak of German immigration was between 1749 and 1754, when 31,896 came into the province. In 1752 the population of Pennsylvania was estimated to be 190,000 of whom 90,000 were Germans. The census of 1790 revealed a population of 433,611 of whom approximately 110,000 were Germans and 100,000 Scotch-Irish. After the Revolution German immigration practically ceased until 1830 when another great wave reached our shores; this, however, passed over Pennsylvania into the Mississippi Valley.

Most German immigrants were farmers. In 1747 Governor George Thomas wrote, "The Germans of Pennsylvania are, I believe, three fifths of the whole population. They have by their industry been the principal instruments of raising the state to its present flourishing condition, beyond any of His Majesty's colonies in North America. The principal part of them are farmers."[28] Most German immigrants had only enough money to pay for their passage; many did not have even that and hence were obliged to come as "redemptioners," being bound out as indentured servants for a sufficient time to repay their "masters" money advanced for their passage. They were a sturdy stock, accustomed to meeting the buffetings of fate without flinching, and were well equipped to cope with the rigors of pioneer farming.

It is an ethnological principle that people immigrating from one country to another tend to settle on land which most closely resembles that which they have left. This was true of German settlers. The ancestors of the Palatinates had lived for thirty centuries on the banks of the Upper Rhine. This is a gently rolling country with fertile soil and is one of the most productive wheat-growing districts in central Europe.

German immigrants looked for this kind of land in Pennsylvania and found it in limestone valleys. Traveling through the wilderness in search of farm homes they appraised the native fertility of the soil by the kind, number and size of trees growing on it. Land that was heavily stocked with hardwoods—oak, maple, hickory, beech—and especially where black walnut grew to large size, was preferred; these were familiar signs of rich land. They chose Hagerstown limestone land as most closely resembling the land of their fathers. Their descendents have clung to this soil type tenaciously, but not exclusively.



Present counties which in 1840 were predominantly English (cross-patched), German (diagonal lines), and Scotch-Irish (dotted).

The close association of Germans with limestone soil is an interesting illustration of the reaction of man to his environment. Says F. J. Turner, "The limestone area in a geological map of Pennsylvania would serve as a map of German settlements. First they filled the 'Limestone Island' adjacent to Philadelphia in Lancaster and Berks counties; then they crossed the Blue Ridge into the Great Valley, which is floored with limestone. Following it toward the southwest along the trough between the hills, they crossed the Potomac into central Maryland. By 1732, following the same formation, they began to occupy the Shenandoah Valley in Virginia." [29]

The hunger of German farmers for limestone soil was not satisfied until they had occupied practically all the narrow limestone valleys of central Pennsylvania as well as the great Cumberland Valley. They followed limestone as the needle follows the pole. In 1709 Hans Herr and Martin Kendig paid £500 to William Penn for 10,000 acres on the north side of Pequea Creek, Lancaster County. This was double the usual price of land at that time but it was one of the best land bargains in colonial history.

Germans, especially sectarians, were wedded to the land. At least ninety-five of a hundred Mennonites were farmers. Children of Amish, an ultra-conservative branch of the Mennonites, were required by their church to be farmers or to engage in some work closely related to farming. Failure to do so was considered a disgrace. Farming was a tenet of the Amish faith; they considered it essential to the practice of their non-conformist religious belief—"Be not conformed to this world"—hence they lived on the land in compact religious-economic groups. Amish children could expect substantial aid in getting established on farms, not only from their parents but also from the church. To them, farming was a preferred way of life, not merely an occupation.

The German farmer had a string prediliction for a self-sufficient family-size farm and for intensive agriculture. He sought to secure an acreage sufficient to feed and clothe his family, but no more; and to accumulate means to provide each of his sons with a farm. Germans came to America with less capital than any other group, most of them with no means at all. The effort required to bring their farms into full production absorbed the energies of several generations and tended to keep the children on the land.

The bond between the German and his land did not begin to weaken until near the middle of the nineteenth century. Then improved means of communication brought hitherto isolated farm communities into touch with the world at large. Factories began to penetrate the country-side. Religious and educational barriers began to crumble. Self-sufficing farming, the center of the German way of life, began to give way to commercial farming. The drift to non-farm pursuits began; gradually Germans became amalgamated with the general body politic. Amish clung tenaciously to the old way of life but they were fighting a losing battle. As a whole, however, Pennsylvania Germans have remained more devoted to the land than any other group in America.

From early colonial days Pennsylvania Germans have been known as efficient farmers. They tilled their acres intensively and built comfortable barns for the livestock. They were the foremost exponents of livestock husbandry as a means of maintaining the fertility of the soil. Their marked conservatism, however, particularly in education, prevented them from taking early advantage of many improved methods in agriculture. In 1788 Johann Schoepf stated, "Where a German settles, there commonly are seen industry and economy more than with others, all things being equal—his house is better built and warmer, his land is better fenced, he has a better garden, and his stabling is especially superior; everything about his farm shows order and good management in all that concerns the land."[30] This was high praise indeed, but it was not far from the truth.

In 1788 Brissot de Warville, a Frenchman, added his testimony: "The Germans are regarded as the most honest, most industrious and most economical of farmers. They never contract debts."[31] Isaac Weld, an Englishman, who visited Pennsylvania in 1795, found them "a quiet, sober and industrious people . . . They are wholly intent on their own business and indifferent to that of others . . . The Germans are some of the best farmers in the United States."[32]

An unbiased historian of Pennsylvania, Wayland F. Dunaway, thus appraises Pennsylvania Germans: "Their chief contribution was to the promotion of agriculture, in which they excelled all other groups. By their industry and skill they made the wilderness a garden spot. Conservative, religious, industrious, frugal, they were a most substantial body of people; close to the soil, they added to the province an element of strength without which it never would have reached its remarkable prosperity."[33]

THE SCOTCH-IRISH

Scotch-Irish immigration was mainly contemporaneous with that of Germans. They were Scots, not Irish (Celts) or a mixture of the two nationalities. They had sojourned in northern Ireland for a few generations, having been colonized there during the reign of James I, beginning about 1610, as pawns in the ill-advised "Ulster Experiment." The reasons for their immigration were economic and religious—exorbitant land rents, "hard times," the Act of Parliament of 1699 which prohibited the exportation of wool from Ulster, and enforced payment of tithes to support the Anglican church, which was particularly repugnant to disciples of John Knox.

Between 1728 and 1776 about 250,000 Scotch-Irish came to America of whom not less than 85,000 settled in Pennsylvania. James Logan, Secretary of the province, was alarmed. Said he, "It looks as if Ireland is to send all her inhabitants hither, for last week not less than six ships arrived . . . The common fear is that if they continue to come they will make themselves proprietors of the province." Immigration came in waves, the largest being in 1717-1718, 1727-1728, 1740-1741, and 1771-1775. Flood tide was in 1771-1773.

Scotch-Irish immigrants found the land in the three original counties —Philadelphia, Bucks and Chester—quite fully occupied by English and Germans, so they pressed on to the frontier, in Lancaster County, which was more to their liking anyhow. Donegal township in that county was settled about 1716; it became the seed-bed of the Scotch-Irish in Pennsylvania. Soon parts of Dauphin and Lebanon counties were occupied. By 1730 adventurous Scots had crossed the Susquehanna into York and Adams counties and had taken possession of the Cumberland Valley. All but fifty families of the 5,000 people in that valley in 1750 were Scotch-Irish. It became the reservoir of Scotch-Irish in America; from it many thousands of pioneers went forth as the advance guard of civilization in central and western Pennsylvania and in western states.

The movement of Scotch-Irish into the Cumberland Valley was abetted by the provincial government. In Lancaster County and elsewhere east of the Susquehanna they had settled in areas that were predominantly German. So much friction developed between the two groups that in 1743 the proprietary refused to sell any more land east of the Susquehanna to Scotch-Irish and made a liberal offer to those already established there to remove to the Cumberland Valley. Most of them gladly accepted the offer.

The proprietary government had an ulterior motive in making this proposal; it desired to use these fearless people as a buffer against possible Indian attack on the eastern settlements. Said James Logan, "About that time considerable numbers of good, sober people came in from Ireland who wanted to be settled. At ye same time also it happened that we were under some apprehensions from ye northern Indians . . . I therefore thought it might be prudent to plant a settlement of such men as those who had so bravely defended Derry and Inniskillen." [34]

Beginning to feel crowded in the Cumberland Valley, the Scotch-Irish planted outposts all along the line of the Indian trading path from Lancaster to Bedford and advanced northward into central Pennsylvania. Settlement of the valley of the Juniata and its tributaries, comprising parts of Perry, Huntingdon, Juniata, Mifflin, Blair and Bedford counties, began about 1740 but was not extensive until the close of the French and Indian War in 1764. All of central Pennsylvania was settled by Scotch-Irish except Union and Snyder counties where Germans predominated.

Southwestern Pennsylvania was formally opened for settlement in 1768, following purchase of the area from Indians. Some Scotch-Irish were located there before then, as squatters, competing for the land with English from Virginia. After the Revolution they migrated into southwestern Pennsylvania in such numbers as to make that region predominently Scotch-Irish, as it is today, comprising the counties of Cambria, Indiana, Somerset, Westmoreland, Fayette, Washington, Allegheny, Greene and Beaver. Between 1792 and 1820 they settled much of northwestern Pennsylvania except counties bordering New York, comprising the counties of Lawrence, Mercer, Crawford, Venango, Clarion, Jefferson, and Warren. The last frontier in Pennsylvania—the counties of Cameron, Elk and Forest—was but sparsely occupied before 1840.

Like German immigrants, Scotch-Irish preferred land most closely resembling that to which they had been accustomed in the homeland. In general, they chose foothills rather than valleys; shale soil rather than limestone. Early immigrants occupied a considerable area of limestone land in the Cumberland and smaller valleys but were quite willing to relinquish it for other soil types. They were distrustful of "dry limestone" land on which there were few springs, preferring the less fertile but better watered shale soils of the foothills.

The distribution of German and Scotch-Irish in Chester and York Counties illustrates the respective soil preferences of the two groups. Pidgeon Hills, Conewingo, Nottingham and State Line "barrens" were settled by Scotch-Irish; the limestone "islands" of the county by Germans. These "barrens" however, produced eighteen to twenty bushels of wheat per acre. In Northampton County the Scotch-Irish "generally avoided the limestone lands (there known as the *Dry Lands*) preferring the slaty hills of Mount Bethel and Allen townships, where they found pure springs of water." [35] In Juniata County, where they had opportunity for free choice they preferred "slate lands bordering the mountains, watered by clear and copious springs" to "limestone lands where the waters sunk beneath the surface and expensive wells were consequently required."[36]

The Scotch-Irish were not partial to limestone valleys, also, because these were heavily wooded and they were not accustomed to woodland. Furthermore, they considered such valleys especially subject to frosts. Germans, on the other hand, were accustomed to a heavily wooded country and were not daunted by the labor required to clear it nor by the frost hazard. Said a loyal Scot, "The German was on richer soil but he was not envied by the men who, in other ways and in less favored places, applied their heads and hearts to nation building. The German loved his farm lands, but the Scotch-Irish would rather cut a 'big road' connecting points remote, would rather set a schoolhouse in some lonesome hollow, than unfold the loveliest expanding valley in Penn's domain." [37]

Little has been written about the Scotch-Irish as farmers, as compared with the many volumes written about the skill of Pennsylvania Germans in this respect, but this does not justify the conclusion that they were poor farmers. As a group they did not, perhaps, produce as bounteous crops as did Germans on their more fertile soils. Their farmsteads, as a whole, did not have the appearance of thrift that characterized the homesteads of the people from the Rhine. They were less interested in livestock husbandry and soil conservation. But they adapted themselves readily to the difficult conditions of frontier agriculture and were alert to take advantage of new and better methods of farming. Being politically-minded, they were foremost in promoting farm organizations.

The most outstanding contributions of the Scotch-Irish, however, were in other directions. Hardy, courageous, self-reliant, they were well qualified to conquer the wilderness. They were a frontier people because they preferred that way of life. No matter how far they ventured into the forest, there they built a schoolhouse and a church.

The qualities that made the Scotch-Irish pre-eminent on the frontier also made them impatient of the restraints of civilization. Their less highly developed instinct for permanence often led them to sell their partly developed farms and move farther into the wilderness; sometimes this was repeated several times. These, however, were but minor faults in comparison with the great contributions of the Scotch-Irish in blazing the way for the expanding life of the Commonwealth.

WELSH, FRENCH, IRISH AND SCOTCH

Prior to the Revolution the most important group, next to the English, Germans and Scotch-Irish, was the Welsh. From 1682 until 1700 they were the largest and most substantial body of immigrants except the English, probably over 6,000. Most of them were Quakers and practically all were farmers.

The first Welsh to arrive, in 1682, were persecuted Quakers from Merionethshire. Before coming they had bought 30,000 acres of unsurveyed land from William Penn; later this was increased to 40,000 acres. It was planned that this tract would be settled by Welsh exclusively so that they might preserve the customs of their native land, settle all disputes "in a gospel manner" and not become "entangled with laws in an unknown tongue." It was expected that this "Welsh Barony" would be an independent unit of government within the province. Warrant for the survey of the tract was issued in 1684. It comprised about sixty-two miles of fertile land north of Philadelphia on the west bank of the Schuylkill in the present counties of Montgomery, Chester and Delaware. Penn planned to dispose of his land to the Welsh under an arrangement somewhat similar to the "patroon concessions" of the Dutch on the Hudson. He issued patents of several thousand acres each to seven Welsh companies, which were expected to sub-divide the land among tenants.

The hopes of the founders were not realized. Not enough Welsh came to occupy the tract fully, and since it was rich soil and close to Philadelphia other settlers desired it and took possession of unseated land, in spite of protests of the Welsh to the proprietary. The provincial government was incensed against the Welsh because they refused to pay quit-rents, as stipulated in the contract, and there were other causes for mutual dissatisfaction. Finally the proprietary threw open the "Welsh Tract" to general settlement, confirmed the titles of settlers of other nationalities who already were established there, abolished the civil authority of Welsh Quaker meetings and instituted provincial government in the area. So ended the "Welsh Barony."

This was not the only "Welsh Tract." Another mass settlement of Welsh was made near Gwynedd and North Wales, Montgomery County, and still another in Chester County. About 1796 a group settled at Ebensburg, Cambria County and a smaller number in Berks and Lancaster counties. After 1720 Welsh immigration practically ceased until about 1840 when a large number of coal miners came into the anthracite region. Some of these became part-time farmers. By the end of the colonial era the Welsh had largely lost their identity and had merged with the English through inter-marriage.

Most of the early Welsh immigrants were farmers. They were thrifty, industrious and God-fearing, as are their descendents on Pennsylvania farms today. Numerous family and place names—Merion, Radnor, Haverford, Bryn Athyn, Gwynedd, Bryn Mawr—bear witness to the important contribution of the Welsh to the development of the state. After a visit to the Welsh Barony in 1708 Oldmixon wrote: "The inhabitants have many large plantations of Corn and breed abundance of cattle, insomuch that they are lookt upon to be in as thriving a condition as any in the Province." [38]

The lists of immigrants in *Pennsylvania Archives* contain many French names. The first census, in 1790, lists 2,341. Most early French settlers were Huguenots who had fled from the persecution that followed the revocation of the Edict of Nantes in 1685. Some found sanctuary in Pennsylvania especially about 1725. They were much better fitted for life in a new country than later French immigrants, nobility who were exiles of the French Revolution.

There was no mass settlement of French; they scattered throughout the province. Many became farmers, especially in the Oley Valley, Berks County; Perkiomen Valley; upper Delaware Valley, especially Monroe, Pike and Lehigh valleys; Conestoga Valley, Lancaster County and Lebanon Valley. A majority, however, became merchants and traders.

During the dark days of the French Revolution a considerable number of the wealthy Bourbon nobility found refuge in Pennsylvania. They were unfitted for farming but some of them and their descendents became eminent in the mercantile and scientific life of the Commonwealth, with such names as Stephen Girard and John James Audubon.

In 1793 a settlement of these titled political exiles was made at Azilum, Bradford County with the intention of developing a cooperative agricultural community. In 1797 the Ceres Land Company, an ambitious project with land in parts of Potter, McKean, Clinton, Clearfield, Cameron and Elk counties, was promoted by Robert Morris for these refugees. Both schemes failed, primarily because members of the French nobility were not able or not willing to work with their hands. In early colonial days western Pennsylvania was French territory for a time; there are traces of French occupancy there in place and family names.

The 8,614 "Irish" reported in the census of 1790 were mostly Scotch-Irish, not Celtic Irish. Not until after 1840 did the true Irish immigrate to Pennsylvania in any considerable numbers, the impetus then being the potato blight which had devastated Ireland for several years. Although most of the immigrants had been small farmers in the homeland, few settled on the land here; they found employment in cities and on public works. There was a small settlement of Irish on farms in Lancaster County.

A number of Scots, as distinct from Scotch-Irish, came to the province before 1790. Most of them settled on farms in eastern counties and soon merged with the English.

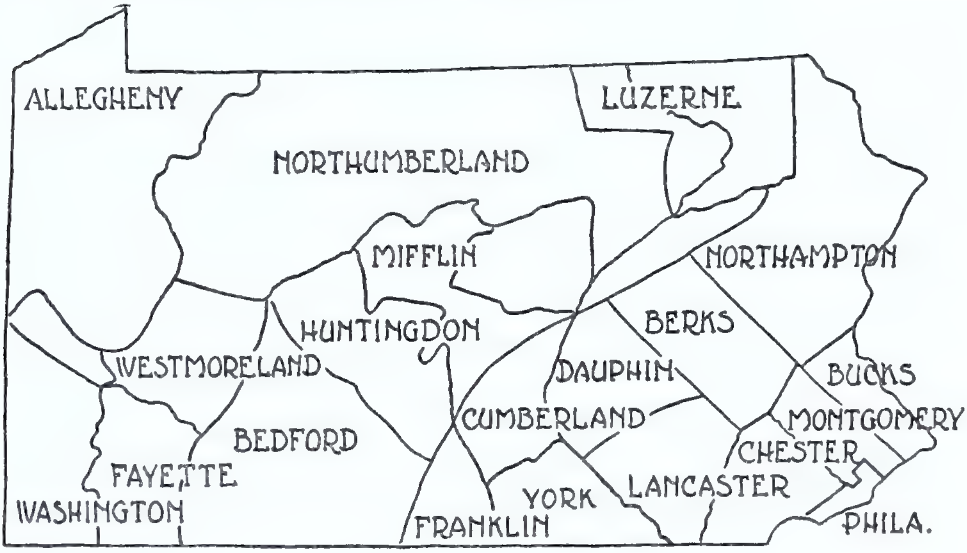
GROUP ANTAGONISMS

In a period when national and religious prejudices ran high, it was to be expected that diverse elements of the population, particularly the three major groups, would develop sharp antagonisms. Fortunately the warring elements had plenty of room to spread out, otherwise partisan strife would have been more bitter. The province was so sharply divided that for many years its ethnic-geography divisions were commonly designated as "English Pennsylvania," "German Pennsylvania," and "Scotch-Irish Pennsylvania."

German and Scotch-Irish frontiersmen were not congenial bedfellows. They settled in neighboring communities in Lancaster County and elsewhere while most of the English clung to the Delaware River basin. Mutual antagonisms developed; their religious faith and philosophy of life were quite different. The conflict was most sharp in Lancaster and Berks counties and in the Cumberland Valley.

The low opinion held by most Germans of "die dummen Irisher" was heartily reciprocated, with interest, by compatriots of Robert the Bruce. The conflict was political as well as economic, social and religious; ultimately it found expression at the polls as well as in competition for land. William Priest, an Englishman, reported the methods used by Germans to displace their Scotch-Irish neighbors with people of their own stock:

"An Irish family often arrives and purchases a plantation which for some years brings them good crops, but for want of manure will in time be worn out (a very common case in America). When in this situation they offer it for sale; the adjacent German families club a sum of money, purchase the land, plough it well and let it remain in that state for three or four years; then they place an emigrant family *from their own country* upon the farm who, by indefatigeable industry and manure, soon bring the land round, pay for the estate by installments and live very comfortably. . . . The Irish family go two or three hundred miles up the country, where they can purchase as much land as they please for from sixpence to a dollar an acre; here they literally break fresh ground and begin the world again.”[39]



Pennsylvania counties in 1790.

Displacement of Scotch-Irish and English farmers by Germans proceeded for more than a century. Former non-German settlements in Lancaster County now are evidenced by defunct or struggling Quaker meeting-houses and Episcopal or Presbyterian churches. During early colonial days the Scotch-Irish were in almost complete possession of the Cumberland Valley west and south of Shippensburg. About 1790 they began to give way to Germans; by 1840 the latter comprised a majority of the farmers in that valley. The Scotch-Irish moved into the western part of the state. The record of this exodus is written in abandoned Presbyterian churches, once centers of active community life, and on tombstones.

The same change of occupancy took place on limestone lands in Northampton County, the Kishacoquillas Valley in Mifflin County and other limestone valleys of central Pennsylvania. The almost complete displacement by Germans of English-speaking farmers on the limestone soils of the state is one of the most significant facts of Pennsylvania agricultural history. The movement was primarily economic; it resulted from differences in mode of farming.

Rural antagonism to the metropolis of the province was as deep-seated in Pennsylvania as in New York. It originated in the failure of the Quaker government at Philadelphia to give protection to the frontier during the French and Indian War. So incensed were the frontiersmen, who were mostly Scotch-Irish, that they marched on Philadelphia, determined to seize the government, and were deterred only by superior military force. With the outbreak of the Revolution they became the most potent factor in the patriot party which overthrew Quaker authority. The only elements of the rural population that were in sympathy with the ruling Quaker party were the sectarians who, however, were a minority of Germans. The fires generated by this conflict did not subside into embers until after 1840. Although diversity of nationality added much to the strength of Pennsylvania agriculture, the racial and sectional antagonisms that it engendered were a deterrent to the political and social progress of the Commonwealth.

Indian squaw pounding corn into meal.

III

PIONEER FARMING

THIS PASSION for emigration," said Brissot de Warville, "will appear to you unaccountable:—that a man should voluntarily abandon the country that gave him birth, the church where he was consecrated to God, the tombs of his ancestors, the companions and friends of his youth, and all the pleasures of polished society, to expose himself to the dangers and difficulties of conquering savage nature." To this cultured French gentleman the pioneer spirit was inexplicable. But most Pennsylvania settlers were made of tougher fiber.

Motives for Migration

The motives that induced westward migration were similar to those that had drawn settlers to America, except the search for civil and religious liberty. Some sought escape from the discipline and restraints of the eastern settlements; they desired to breathe the free air of the frontier, unhampered by the conventions of civilization. Others migrated for economic reasons; they hungered for free or cheaper lands and for soil that had not been impoverished by a generation of cropping. Some desired an opportunity to make a fresh start in life. Still others went from a spirit of adventure; they wanted to see new country and to have new experiences; probably this motive was uppermost with most pioneers. "It is difficult," says de Toqueville, "to describe the rapacity with which the American rushes forward to secure the immense booty which fortune proffers to him. In the pursuit he fearlessly braves the arrow of the Indian and the distemper of the forest. . . . Emigration was at first necessary to them as a means of subsistence; it soon becomes a sort of game of chance, which they pursue for the emotions it excites as much as for the gain it procures."

The westward advance was in two stages—the hunting and trading frontier and the farming frontier. George Croghan was the outstanding Indian trader of colonial Pennsylvania; he traveled wilderness trails long before pioneer farmers made clearings. The Indian trail became the trader's 'trace'; later the trace was widened into a bridle path, then to a road. Most trading posts were located on the sites of Indian villages, usually at commanding points on streams. Hunters and traders were transients; they struck no roots into the soil. The farming frontier, which was permanent, followed the trading frontier.

Until after 1730 farming was limited to the area within a hundred miles of Philadelphia. All the first settlers—Dutch, Swedes, Welsh and English—hugged the banks of the Delaware and Schuylkill and their tributaries. The first venture into the wilderness came in 1683 when thirteen Mennonite families under the leadership of Pastorius founded Germantown. The immediate prosperity of this settlement was phenomenal. After the first year one of the settlers wrote to his friends in Germany, "I have so much grain, such as Indian corn and buckwheat, that this winter I shall be better off than I was last year." The pioneering movement of Germans and Scotch-Irish into Pennsylvania east of the Alleghenies occurred between 1690 and 1740; the trans-Allegheny migration between 1740 and 1790, and the settlement of northwestern Pennsylvania between 1790 and 1840.

The typical frontier family was young and poor. Only a small sum was needed to cover the cost of transportation and to maintain the family until the farm was self-supporting. A hundred dollars, even less, would suffice provided the family already had the minimum necessary equipment—a team of horses or yoke of oxen, a plow, a wagon or ox-cart, a cow or two, a few hogs and chickens, seed, and a few simple articles of farm and household equipment. A yoke of oxen cost $60 to $90; a cow $15 to $20. A majority of young couples traveled on money borrowed from the fathers which had been saved, laboriously, from the earnings of farms in older settlements. There were no banks to extend credit. If equipment was needed beyond what the parents could supply, Lancaster and Carlisle were the great outfitting points.

Rarely did a new farm support the family until after the second year, for the number of acres that could be cleared and planted during the first year was small. Sometimes supplies, rarely money, could be earned by working for earlier arrivals; but usually most of the living for the first two years had to come from forest and stream and from the meager supply of food that had been brought from the settlements.

ON THE TRAIL

Conditions met on the trail by German settlers of Lancaster County about 1725 are described by Franklin Ellis: "Two or more families started out from Philadelphia or Germantown on what was then a journey of several days. . . . The small children were placed in the wagons while the grown and half grown went on foot. . . . There were fallen trees and hanging vines to be removed, streams to ford, marshes to be avoided or crossed, so that stoppages were frequent and progress slow. . . .

"After arriving at the place selected, which was always convenient to some spring, the covered wagons served as a home for the children and females, while the men and boys put up temporary shelters for themselves until a log cabin could be built. . . . The open air was their kitchen. . . . Here the meals were prepared and served on a table consisting of the end-gate of the wagon nailed upon the stump of a tree. . . .

"Before the smouldering ashes from firing the clearing had time to cool, the old-fashioned wooden plow, drawn by the heavy team, tore deep furrows through the blackened mould. . . . There were many and strong roots to encounter and innumerable stumps in the way, and the labor was hard. . . . Early and late the work went on until the ground was ready for the first seeding. . . . Then the party moved off to begin familiar work for the next neighbor, because it was found advantageous for them to work together." [1]

Trans-Allegheny pioneers had a much more difficult time. They could not use wagons; only pack horses could travel the narrow trails and only absolute necessities carried. The young, weak and sick rode; the able-bodied of all ages walked, men in front, women and children in the rear. In his diary for April 24, 1773, David McClure describes the cheerfulness with which pioneer families met the hardships of the trail: "I noticed particularly one family of about twelve in number. The man carried an ax and a gun on his shoulder; the Wife, the rim of a spinning wheel in one hand and a loaf of bread in the other. Several little boys and girls, each with a bundle according to their size. Two poor horses, each heavily loaded with some poor necessaries. On the top of the baggage of one was an infant rocked to sleep in a kind of wicker cage lashed securely to the horse. A cow formed one of the company, and she bore her portion, a bed cord wound around her horns and a bag of meal on her back." [2]

Fortitude to a somewhat less degree was required of a family which set forth from Carlisle in the spring of 1784. "They were provided with three horses; on one rode the mother carrying her infant, with all the table furniture and cooking utensils; on another was the packed store of provisions, plough irons and agricultural tools. . . . The third horse bore a pack saddle and two large creels made of hickory withes in the manner of a crate, one over each side of the horse, in which were stowed the beds and bedding. In the center of these creels there was left a vacancy just sufficient to admit a child in each, laced in with their heads peeping out therefrom. Along with this company were one or more cows which furnished them milk night and morning." [3]

When the trail had been widened into a rough road a covered wagon was the standard vehicle of the pioneer. It was drawn by a team of horses or yoke of oxen, sometimes by a horse and an ox, or an ox and a cow. The principal routes to the West were Forbes' Road from Philadelphia to Pittsburgh via Lancaster and Carlisle—the present Lincoln Highway; and the general route of the present William Penn Highway. "All America seems to be breaking up and moving westward," wrote Morris Birkhead in 1817. In the spring of 1811, according to an observer at Robbstown, Westmoreland County, 236 wagons passed westward in one month. Many moved West without even a horse: "Often the back of the poor pilgrim bears all his effects, and his wife follows bare-footed, bending under the hopes of the family." [4]

Travel in pioneer days was hazardous. Even as late as 1817, according to Fordham, "Cove Mountains and Sidelong Hills (on the Lincoln Highway west of McConnellsburg) are infested with banditti, after whom about 40 young men went with their rifles about a week since. They have not yet attacked travelers but they plunder farmers of their clothes and cattle." [5]

Sleeping was mostly in the open, on pine or hemlock boughs. If inclement weather drove pilgrims to seek shelter in an inn they were likely to experience the discomforts related by Arthur Lee: "Ourselves, several waggoners, our friend and his wife and eight children and a young daughter, all undressed and went to bed on the floor together in the same room."

Some pioneers were of a roving disposition and did not long remain on their clearings. After neighbors became more numerous and game less abundant they sold their meager "improvements" and headed for the unbroken frontier. In 1790 Benjamin Rush described what he called "the three species of settlers." The first, he says, is primarily a hunter; with him farming is incidental to the chase. He resembles the Indian in his mode of life. Eventually he disposes of his small clearing to a settler who enlarges the crop land and makes minor improvements on the cabin. But the new owner is easily discouraged by the buffetings of fate and soon moves on. His successor has what the others lacked—the instinct for permanence. He makes improvements on the farm and home, increases his livestock and identifies himself with community life. "It is to the third species of settlers only," says Rush, "that it is proper to apply the term farmer. It was from the farms cultivated by these men that the American and French armies were chiefly fed with bread during the late revolution." [6] Farmers of these three types were on every frontier, but the first two—unstable and dissatisfied—were in the minority; most settlers stayed on the land of their choice and it became the home of the family for generations.

LOCATING THE FARM

The first settlers took up land along the Delaware and its tributaries not only because of convenience of transportation but also because much of this land was not heavily wooded. Their farms had a narrow frontage on the stream and ran back into the woods. Access to a spring was a prerequisite. When Penn and his countrymen came they found the best land along streams occupied by Swedes and sought to dispossess them. In 1699 Penn offered the Swedes 10,000 acres of land in Montgomery County, which was far in the interior then, in exchange for their land along the streams. Few Swedes accepted the offer. [7]

Another reason why the first settlers located near streams was because these were necessary not only for water supply but also to turn grist and saw mills, both of which were indispensible. In the ridge and valley region of central Pennsylvania there was a tendency to locate farms along the upper margins of the valley where there were bold springs, rather than on the floor of the valley.

Farms usually were bounded by natural features, such as streams and ridges. Joseph Doddridge says that many pioneer farms of southwestern Pennsylvania were in the shape of a bowl; the buildings were in the valley and the farm boundaries were the tops of surrounding hills, so that "whatever comes to the house and barn comes down hill." [8]

The primary consideration in locating a farm, however, was fertility of soil. Most settlers preferred hardwood land as being potentially stronger, but John Lorain, a prominent pioneer farmer of Philipsburg, made out a strong case for softwood land. In 1812 he said, " I prefer land to clear for a farm that is in white pine or hemlock rather than hardwoods, because the roots are more easily broken by a plow, suckers do not spring up as much, not as much brush to grub out because of dense shade, and the timber is more readily burnt, being softer and more inflammable. . . . The timber of white pine, moreover, is particularly valuable in a new country for buildings, which are erected with it in one half the time required by harder and heavier woods. . . . Rails, also, for fencing are readily formed from this timber and are only exceeded in durability by chestnut." [9]

By far the most important tool of the pioneer was the axe, in the use of which he acquired great dexterity. It was indispensible in clearing land, building the cabin, making fences, cutting firewood and constructing bridges. A cross-cut saw, drawing knife and auger completed his kit of tools. About the only farm implement brought in from the older settlements was a plow; the harrow, drag and other necessary equipment were home-made.

CLEARING LAND

Most Pennsylvania farms were carved out of the forest. Pioneers were obliged to devote a large proportion of their time to clearing land, hence harvests for several years were barely sufficient to feed the family. Only those who occupied meadows along the Delaware and its tributaries and the comparatively few settlers who occupied treeless areas in the interior were exempt from the onerous labor of clearing the forest.

In their homeland the Swedes had been accustomed to clearing new ground by *svedjebruket,* or burning. Some of them practiced this method on the "South River" (Delaware) in 1654-1655.[10] After being felled, the trees were left for a year to dry, then the useful logs were removed and the tops and branches burned. Rye, wheat or oats were sown among the stumps.

Few English or Scotch-Irish settlers were accustomed to clearing land. They adopted the Indian practice of girdling rather than felling the trees. A wide belt of bark was chopped off around each tree near its base; this killed it so that sunlight could reach crops planted beneath it. Then underbrush and saplings were grubbed out. In a few years dead branches began to fall and eventually "deadened" trees blew down. Then branches were piled on the fallen trunks and fired. Blackened butts, twelve to fifteen feet long, were left after this burning; these had to be "niggered off" in a "log rolling," to which the farmer invited his neighbors.

As related by Thomas McElwee of Bedford County: "He gives the word to 18 or 20 of his neighbors the day before the frolic. When they assemble they generally divide into two companies. A captain is chosen by acclamation for each company and the captain chooses his men, each naming a man alternately. When the whole is formed they set to work, provided with hand spikes, and each company exerts itself to make more log heaps than the other. . . . Nothing is charged for the work and the only thing exceptional in these frolics is the immoderate use of whiskey. In general, great hilarity prevails." [11] The piles of blackened logs then were burned.

The main advantage of girdling was that it saved the labor of felling and burning trees during the first few years, when time was most precious. It also gave a plentiful supply of seasoned fire wood. Little humus was destroyed. When the dead trees blew down they were uprooted, thus facilitating the removal of stumps and roots. The chief disadvantages of girdling were inconvenience, loss of produce from having to cultivate around the trees for a number of years, and danger from falling limbs. "The falling branches incommode us for years," said McElwee, "covering our grain every winter and causing a great deal of labor in picking it up. The trees fall over fences and demolish them; sometimes they fall on horses and cattle, killing or maiming them; and not infrequently men and boys have been killed." [12]

Germans almost invariably cleared land by the "Yankee method," so called because it was practiced almost universally in New England.

They cut down all trees, grubbed out saplings and underbrush and pulled or dug out all but the largest stumps. Large trees were cut into eleven foot lengths and split for rails, or into four foot lengths for firewood. Brush, saplings and small stumps were burned, leaving the land clear for crops except for a few of the larger stumps. These were left until they had rotted sufficiently to be removed easily in from five to ten years, depending on the species. Germans commonly cooperated in clearing land.

The advantages of this method were immediate use of most of the land for cropping, greater facility in plowing, harrowing and reaping, and the beneficial effects on the soil of wood ashes. The ashes from burning great piles of logs, moreover, could be converted into potash and sold, thus providing cash income the first season. Potash and its refined product, "pearl ash," were important sources of income for pioneer farmers. In clearing and burning ten acres perhaps a ton of potash, worth $200, could be secured. According to Tench Coxe, in 1794, "The potash or pearl ash will produce as much value as all the expense and labor of clearing." [13]

The main disadvantages were the prodigious amount of labor required and the destruction of humus by burning, although this loss was realized by few at that time. One who did was John Lorain of Philipsburg who protested, "After the burning has ceased, stumps (from under which the rich, loose soil has been burnt) are seen standing on their roots like spiders, whose bodies are supported by long legs, and clay or gravel appears where a luxuriant soil lately prevailed. It requires but little reflection to determine that this practice cannot be eligible for those who are determined to continue on the soil." [14]

The labor of clearing heavily wooded land, whether by girdling or by burning, was tremendous. Only the man who has attempted to subdue a tract of forest knows the great physical effort which it entails. The time required varied with the character of the forest cover. In areas near Philadelphia, where the trees were so far apart that "a cart or wain may go through the middle of the woods between the trees without getting any damage," as Gabriel Thomas reported, the operation was not difficult. Sometimes there was little underbrush to grub out because it had been destroyed by forest fires. In his sanguine prospectus for settlers, written in 1681, William Penn asserted, "Two men may clear as much Ground by Spring (when they set the Corn in that Country) as will bring in that time twelve months Forty Barrels, which amounts to two Hundred Bushels."

In the comparatively treeless areas of Franklin County, according to Alexander Thomson, "Three men will clear three acres in six days, just for the plough; and in general over all the country hereabout a man will do forty rods a day." [15] Henry B. Plumb states that two or three weeks were required for one man to clear an acre of lightly timbered land in the Wyoming Valley and split the 800 rails required to fence it. In 1834 James Oakley of Susquehanna County "cleared twenty-three acres of light-timbered new ground, seeded it to wheat, rye, oats and corn, at a total cost of $334.88 for which he had grain and straw valued at $496.25 the first year, leaving the settler, at a moderate calculation, $151.37, which would pay for the land at $3.00 an acre and leave near a hundred dollars profit." This was very unusual; it was, perhaps, the rosy version of a land speculator. On the heavily timbered land that prevailed in most of the state much more time was required and the farm did not yield a profit until the second or third year.

CROPPING NEW GROUND

Not always was new ground plowed; large roots remaining in the soil often made this impracticable. Usually the first crop was grain. For small grains the surface was merely scratched with an A-harrow, seed broadcasted and harrowed in. For corn the Indian practice of planting in hills without breaking the middles was followed. In central and northern Pennsylvania sometimes the first crop was potatoes, which grew luxuriantly on soil that was full of partially decayed organic matter. "Wheat is usually the first crop sown on new land," reported Thomas B. McElwee of Bedford County in 1832, "unless we clear a patch for potatoes. The average crop is 12 to 20 bushels per acre. The second crop is rye, oats follow, then corn. This is the usual course. It is then left out for a year or two and the course begins again."

The premier crop on new ground on most soils was corn. It could compete more successfully than small grain with wild growth and met the food needs of the pioneer and his livestock more adequately. It required less time to produce and harvest than any other cereal and was available for use from the roasting-ear stage on. The stalks could be used for winter fodder. All work on new ground crops was done by hand; tillage was limited to chopping out weeds and sprouts.

In spite of crude methods of husbandry, yields on new ground were good. "We have had the mark of good Ground amongst us," said William Penn in 1685, "from Thirty to Sixty fold of English Corn (wheat). Upon Tryal we find that the Corn and Roots that grow in England thrive very well here, as Wheat, Barley, Rye, Oats, Buck-Wheat, Pease, Beans. . . . Our low lands are excellent for Rape and Hemp and Flax."[16] In 1686 Dr. Nicholas More wrote enthusiastically to Penn, "I have had seventy ears [grains] of Rye upon one single root, proceding from one single Corn; forty-five of Wheat, eighty of Oats. . . . It would seem a Romance rather than a Truth if I should speak what I have seen of these things."

At first all cleared land was cropped with grain except a small patch of flax and a garden. Pastures and meadows of tame grasses were a later development. The few animals that the pioneer took to his new home foraged in the woods on native grass and browse for their meager sustenance. In winter, maple trees were cut down so that they might eat the succulent twigs; this was called "long fodder." "The Weeds in our Woods," said William Penn, "feed our Cattle to the Market as well as Dairy. I have seen fat Bullocks brought thence to Market before Mid-Summer. Our Swamps and Marshes yeeld us coarse Hay for the Winter." [17] This, however, was in the Delaware Valley, where forests were more open than in other parts of the province and native grasses more abundant. The supply of hay in new settlements often was so inadequate for winter fodder that cows went farrow (dry) and not infrequently starved to death.

SALT

No frontier farm could be wholly self-sufficient; it was necessary to barter for salt, iron, spices, glass and a few other necessities. Of these, salt was by far the most important. Sometimes a little could be secured from local salt licks but usually it had to be imported for both family and livestock. Salt was a common unit of value on the frontier; it would buy supplies where money would not.

During the Revolution salt was so scarce that a bushel brought $200. In 1790 twenty bushels of wheat were required to purchase a bushel of salt. Beginning about 1796 salt from deposits at Onondaga, New York, became available in large supply and a little later from deposits in western Pennsylvania.

Once a year, usually in the fall, a pack-horse expedition from each frontier neighborhood made the trip East to secure salt, iron and a few other necessities. Since little or no hard money was available, furs, whiskey and ginseng were used in barter. Doddridge, a pioneer of southwestern Pennsylvania, says: "The barter for salt and iron was first made in Baltimore. . . . Each horse carried back two bushels of alum salt weighing 84 pounds to the bushel. The common price of a bushel of alum salt at an early period was a good cow and calf. . . . No one was permitted to walk heavily on the floor while the operation of measuring salt was going on." [18]

WILDLIFE

Pioneer farming was intimately associated with wildlife. Frontier farmers were almost as dependent for food on wildlife as on crops and livestock. Every farmer was a hunter and trapper—he had to be. Wildlife not only helped to feed and clothe his family but also supplied furs and pelfries which could be bartered for supplies. In 1804 the wholesale prices of furs and pelts were: deer, 75 cents to $1.00; bear, $1.00 to $3.50; beaver, $1.00 to $2.50; otter, $1.50 to $4.00; red fox, $1.00 to $1.10; mink, 20 to 40 cents; muskrat, 25 to 30 cents.

Some pioneer farmers became professional hunters. "Once hunters," says Crèvecoeur, "farewell to the plough. A hunter wants no neighbors. Their success in the wood makes them neglect their tillage." George Smith of Elk County was an outstanding hunter of his time; he "killed in this wilderness 14 panthers, 500 bear, 30 elk, 3000 deer, 500 catamounts, 500 wolves and 600 wildcats. He has killed seven deer in a day and as many as five bear in a day."[19] Wildlife was harmful as well as helpful to man, but the gain far outweighed the loss. Settlement of Pennsylvania would have proceeded much more slowly if wildlife had not been abundant.

The most prized wild animal was the deer. Venison was a staple article of diet. One of the first settlers, Mahlon Stacy of Bucks County, wrote to a friend in England, "we have brought home to our house by the Indians seven or eight fat bucks in a day, and sometimes put by as many, having no occasion for them." Deer skins were used for clothing and for making harness, ropes and thongs. So plentiful were deer that as late as 1750 there were numerous complaints of destruction of grain by them. Deer meat was preserved for winter use by drying it over a slow fire; this "jerked" venison, or "jerk," was used on long expeditions.

Bear meat was in about as common use on the frontier as pork is today. Many families of western Pennsylvania lived mainly on bear meat during the winter months. It was considered superior to venison, being juicier, and was preserved for winter use by pickling. Bear were hunted with dogs who treed them, caught in steel traps or trapped in log pens. They often weighed 400 to 500 pounds. A large amount of oil was rendered from bear fat; this was used in cooking and for lighting the cabin.

Bear were particularly fond of swine flesh. They were able to gratify this appetite frequently because of the frontier practice of allowing swine to roam the forest, where they lived largely on mast. "The bear confines himself to hogs," said John F. Watson in 1830; "he springs suddenly upon his victim, grasps him in his arms, or fore legs with a force which is irresistable, erects himself upon his hind legs like a man and makes off in an instant with his load. The piercing squeal of the hog is the first warning of his presence to the owner. A large bear which meets with no obstruction will make his way through a thick wood in this manner with a hog of good size faster than a man on foot can follow."[20]

Retribution soon overtook the marauder. "After eating sufficient to satisfy his appetite," says Henry G. Ashmead, "he would return later to devour the remainder of the carcass at his leisure. The settlers, knowing this weakness, would set a heavy, smooth-jawed steel trap, attached to which was a long chain ending in steel claws. The bear, once caught in this trap, would drag the chain along the ground and the claws, catching upon the bushes, would compel him to such exertion in freeing himself that he would become exhausted; and when overtaken, as his track could be readily followed, he fell a comparatively easy prey to the huntsman." [21]

Herds of buffalo roamed parts of Pennsylvania in pioneer days especially from Lake Erie southward through the valley of the Susquehanna and its tributaries. In the autumn of 1773 a herd of over 12,000 passed along the west branch of the Susquehanna on the annual fall migration down the Cumberland and Shenandoah valleys. Hunters posted themselves by deeply worn buffalo trails during the migrating season and killed them by hundreds. Thomas Ashe, writing from Erie in December 1806 relates, "One of the first settlers in this country built his log house on the immediate borders of a salt spring. He informed me that for the first several seasons the Buffaloes paid him their visits with the utmost regularity. . . . At that period he supposed there could have been not less than ten thousand in the neighborhood of the spring. . . . In the first and second years this old man with some companions killed from six to seven hundred of these noble creatures, merely for the sake of their skins, which to them were worth only two shillings each." [22]

Buffalo were exterminated soon or driven farther west; by 1800 only a few survived. One of the last was killed near Capitol Hill, Harrisburg, in 1792.[23] A number of Pennsylvania place names, as Buffalo Run and Buffalo Valley, commemorate the passing of the thundering herd. Some of the main highways of today follow closely the buffalo trails of 1730.

Elk were widely distributed, especially in the southern part of the province. They ran in large herds and beat broad paths to salt licks. By 1840 most of them had been exterminated.

Turkeys were numerous throughout most of the state and were easily killed. They weighed thirty to forty pounds and could be bought for a shilling. So ruthless was the destruction of these noble birds that they had practically disappeared from most of the state by 1800.

The most important meat-producing bird of colonial Pennsylvania was the wild or passenger pigeon. "They flew over Philadelphia," says an eye-witness, "in flocks which obscured the sun for two or three hours and were killed by hundreds by people using sticks on the tops of homes." Crèvecoeur relates his experience at Carlisle about 1770: "I caught fourteen dozen at one time in nets. As many as a man could carry home were sold for a penny. Every farmer kept a tamed wild pigeon in a cage at the door ready to be used at any time to decoy the wild ones as they approached."

The reminiscences of Charles Miner of Wilkes-Barre contain this description of pigeon flights: "The whole heavens were dark with them, the cloud on wing continuing to pass for an hour or more and cloud succeeding cloud. There were not millions but myriads. . . . Towns were built by them for five or six miles in length along the Meshoppen—every branch and bough of every tree holding a rude nest." [24] The last great flight of pigeons over Lancaster County was in the spring of 1846: "The dense mass of pigeons extended to the eastern horizon and as far north and south as the eye could reach, and was continuous from about 12:30 to 4:30 P. M." [25]

The seemingly inexhaustible supply of pigeons was quickly decimated by wholesale slaughter, mainly by market hunters. In May 1851 the *Elk Advocate* reported, "The American Express Company carried in one day over the New York and Erie Railroad over seven tons of pigeons to the New York market." Thereafter the numbers declined sharply. The last stand of wild pigeons in Pennsylvania was in the wilds of Elk, Warren, McKean, Cameron and Pike counties where they were seen in constantly dwindling numbers up to 1900. The species is now extinct. Among other birds which helped to keep the tables of pioneer farmers supplied with fresh meat, ruffed grouse, ducks, geese and swan were most abundant.

The streams teemed with fish of which shad, herring, trout and pike were most important as food. Said Thomas Budd in 1685, "There are also in the spring great quantities of Fish like *Herrings;* with plenty of Fish call *Shads*. . . . The Inhabitants usually catch quantities which they salt up and pack in Barrels for Winter Provisions." [26] Some years great shoals of herring ran high up the Susquehanna and the Delaware and their tributaries; they were caught in seines, dried and smoked for winter use. According to Henry G. Ashmead, "In little creeks, herring swam in such shoals that they almost shoveled them up in their tubs."

The premier food fish of the pioneers was shad. "The Susquehanna shad," says Gilbert H. Fowler, "constituted the principal food of all the inhabitants along the Susquehanna. No farmer was without a barrel of shad the year round. . . . The common price was three or four cents each. . . . At the Webb fishery I have known eleven and twelve thousand shad to be taken at one haul. . . . Shad were considered the best and cheapest food for all." [27]

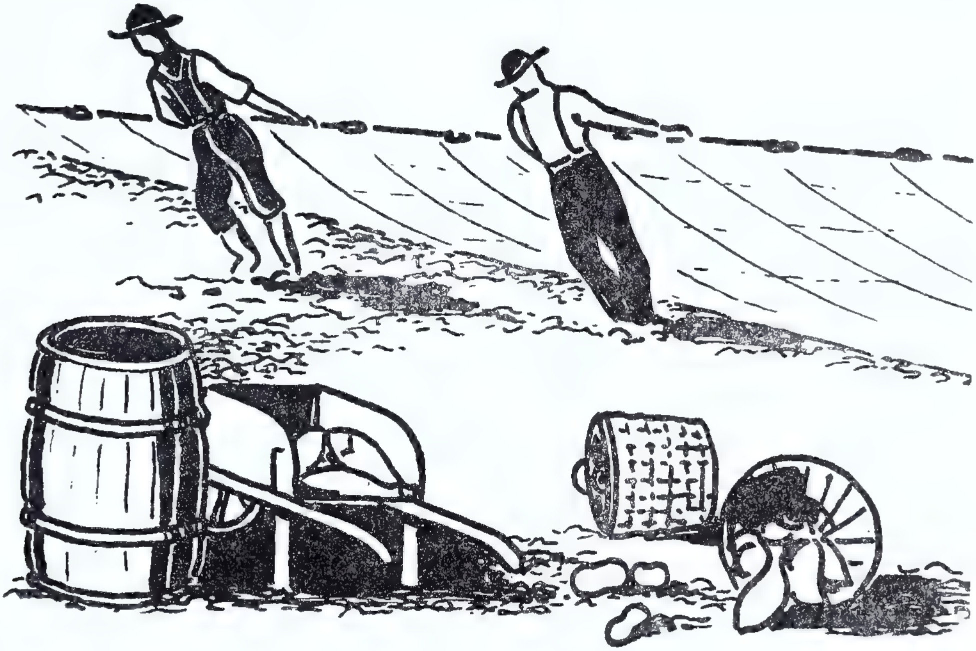
Another eyewitness corroborates this exceptional haul: "From about the tenth of April to the tenth of June almost every man, woman and child within twenty miles of the Susquehanna feasted and fattened on fresh shad, and every family salted down from one to three barrels for use during the remainder of the year. . . . At Stewart's fishery, one of about a dozen in Luzerne County, 10,000 shad were taken at a single haul. The seine could not be drawn to the shore and the shad were scooped into boats, thence loaded into wagons and drawn away." [28]

A resident of Wyoming Valley recalls, "Seines were used by some but shad could be caught by anyone with a hook and line. They needed no bait—only just throw in and pull out and you would have a shad on your hook nearly every time. These were large fish-hooks—they had three prongs with a barb on each."[29]

After about 1830 construction of canals and dams began to interfere with the free movement of shad upstream and the catch dwindled. They were taken in considerable numbers until about 1870, since then construction of river dams on the Susquehanna prohibited the shad from ascending, and the pollution of the Delaware and its tributaries discouraged the shad.

The most destructive wild animals of pioneer days were wolves. They were dangerous to humans only when in packs of a half dozen or more and when desperate from hunger, but their depredations on livestock, especially sheep and calves, caused great loss. Sometimes a pack would destroy a whole flock of sheep in one night. A wolf could carry a lamb for miles, slung on his back.

The Swedish court at Upland (Chester) authorized a bounty of forty guilders for each wolf scalp and ordered that fifty-two "wolf pitts or trap houses" be built. In 1682 it was enacted, "If any person . . . shall kill a dog-wolf hee shall have ten shillings, and if a bitch-wolf, fifteen shillings, if slain by a white man; if by an Indian, five shillings and the skin for his pains."[30] In spite of these generous bounties, wolves continued to render sheep husbandry near Philadelphia hazardous. In 1695 it was necessary for the Grand Jury of Chester County to impose



Seining shad on the Delaware.

a special tax for wolf bounties—one pence per pound on personal and real estate and a poll tax of three pence.

The depredations continuing, in 1705 a law was passed providing that anyone who became a professional wolf-killer by agreeing to devote at least three days a week to hunting and who registered with the county court would be paid a bounty of twenty-five shillings a head. The bounty in 1724 was seven shillings six pence for every wolf puppy and fifteen shillings for every dog or bitch wolf, to be paid from county funds. [31]

In western and northern Pennsylvania wolves continued to wreak havoc on flocks and herds until after 1840. They were particularly numerous in the Wyoming Valley. There it was necessary to drive all sheep and cattle at night into high enclosures around which fires were kindled. Stout-hearted pioneer women, snowed in for several months, heard the howls of wolves and the screams of panthers around their cabin homes. When ravenously hungry, wolves in packs attacked men. "Many men," says Henry B. Plumb, "have been overtaken by night at a distance from home, and sometimes only a short distance, and have been forced to climb trees to get out of the reach of wolves and sit there all night. As the morning sun began to give a little light the wolves would sneak off one by one until they were all gone and the shivering traveller could come down and go home." [32]

In 1840 the General Assembly passed "An Act to Encourage more Effectively the Destruction of Wolves and Panthers in the counties of Luzerne, Susquehanna, Wayne, Pike, Jefferson, McKean, Tioga, Potter, Bradford and Monroe." [33] The bounty on a full grown wolf then was $25; on a wolf puppy, $12.50; on a full grown panther, $16; on a puppy panther, $9. Under the stimulus of these liberal bounties to hunters and trappers and by community wolf drives, wolves had been almost exterminated by 1860. In wolf drives a large area, perhaps half a township, was surrounded by hunters. At a given signal all advanced toward the center, making an outlandish noise. Few wolves within the cordon escaped. The last bounties paid by counties for wolf scalps were: Warren, 1866; McKean, 1868; Elk, 1877; Clearfield, 1881; Forest, 1884; Tioga, 1886; Potter, 1890.

Panthers or catamounts were numerous enough in pioneer days to keep settlers constantly on guard. They were cowardly, afraid of dogs, and seldom attacked humans but often killed livestock. A panther was as strong as a bear and could overpower and carry off a hog or calf without a struggle. In 1806 the bounty on panther heads was $8 and the pelt was worth $4. In 1819 the General Assembly increased the bounty to $12 and in 1840 to $16. With these incentives to hunting and trapping, panthers soon were found only in the most inaccessible mountain glens. The last bounties paid by counties for panther scalps were: Forest, 1848; Cameron, 1851; Elk, 1857; McKean, 1859; Warren, 1863.

Red fox and wildcats were very destructive to poultry. In 1724 a bounty of two shillings was paid for the scalp of a grown red fox. Wildcats have been practically exterminated but red fox still are destructive.

Charter members of the Tall Tale Club, especially wide-eyed and credulous visitors from Europe, gave their imagination free rein in describing the rattlesnakes of provincial Pennsylvania. Such a one was John Campanius who travelled through the province in 1642 to 1648. "There is here," he says, "a large and horrible serpent which is called a *rattle-snake*. It has a head like that of a dog and can bite off a man's leg as clear as if it had been hewn down with an axe. . . . These snakes are three yards long and as thick as the thickest part of a man's leg. . . . Their skins are much sought after by pregnant women; they tie them around their bodies and are quickly and easily delivered." [34] We are justified in raising a skeptical eyebrow at this statement and also at the tale of John David Schoepf, in 1783: "A rattle-snake of uncommon size was killed in the year 1778. . . . It was 18 feet long and the stript skin measured two and a half feet in breadth." [35]

Rattlesnakes were numerous and dangerous enough in pioneer days without these exaggerations. W. J. McKnight, a careful historian of Jefferson County, reports: "About 1803 or 1804 John Johnson's wife went out from her cabin (Mercer County) early one morning to get her cows. She had not gone far until she found herself surrounded with rattlesnakes. They were in such numbers that she was compelled to climb a dogwood that stood near by. Her cries for help brought her husband and a neighbor. With hickory poles the two men cut their way through the snakes until Mrs. Johnson was relieved. The yellow rattlesnakes were counted and piled, two hundred in number." [36]

The same historian records, "In 1824 David Postlethwait, Nathaniel Postlethwait and James Stewart, three Jefferson County farmers, killed in two hours three hundred rattlesnakes at a den about a mile from the cabin of David Postlethwait." [37] H. Hollister, an historian of Lackawanna Valley, reports that Elias Scott, who settled there in 1792, "found a rattlesnake den on the upper waters of Spring Brook and killed 750 of the reptiles in a single day; the next day he slew 375 more." [38]

It is possible that the number of snakes killed on these expeditions increased with the years, but undoubtedly they were very numerous in the mountainous sections of the state and a constant menace to man and beast. Hogs, which are immune to their poison, killed many; others were killed by dogs. Farmers wore thick woolen stockings and buckskin breeches, which offered some protection. As an added precaution they carried a generous bottle of the sovereign snake remedy of that period—corn liquor.

Black and gray squirrels did far more damage to farm crops, especially corn and wheat, than the value of their meat. Their migratory habits made them destructive over a wide area. Pioneer farmers in southwestern Pennsylvania "frequently had almost the whole of their little crop of corn destroyed by squirrels and raccoons; so that many families, after an hazardous and laborious spring and summer, had little left for the comfort of a dreary winter." [39]

About every seven or eight years, or whenever the acorn and nut crop was scanty in northern and central counties, squirrels migrated to southeastern counties in search of food. They traveled in armies numbering many thousands, devastating all grain fields on the line of march. In 1796 it was reported, "During last week several hundred squirrels per day crossed the Susquehanna from Cumberland County into Dauphin County. Some of the inhabitants who live near the banks of the river have been enabled to salt barrels of them for winter's use." [40]

Unlike other wildlife, squirrels seemed to increase rather than decrease after settlement began, since farm crops were added to their bill of fare. The General Assembly authorized counties to offer a bounty of three pence a head but this did little to check them. In 1749 the sum of £8,000 Pennsylvania currency was expended as bounties on more than 640,000 squirrels. [41] This exhausted the treasuries of a number of counties. The minutes of the General Assembly for 1750 record, "The farmers complained this year that the bounty given for squirrels had tended to their injury, for the labourers, instead of helping them with their harvest, had taken up their guns and gone to hunt squirrels, as they could make more by squirrel scalps than by wages at day labour." The bounty then was reduced to one and a half pence per scalp.

Squirrels were particularly numerous in the southwestern part of the state. In 1784 an Act of General Assembly read, "Whereas it appears to this House by sundry petitions from the counties of Bedford, Westmoreland, Washington, and Fayette that great damage is done to the grain in these counties by squirrels, the Commissioners in these counties are authorized to levy up to £300 a year to be paid as bounties for squirrel scalps at two pence each."

In 1807 the General Assembly authorized the county Commissioners of Bedford, Westmoreland, Washington, Armstrong, Indiana, Fayette and Greene counties to pay a bounty of one and a half cents for squirrel scalps, which were to be received for taxes in lieu of money. In 1811 this Act was extended to include Franklin, Somerset, Butler, Mercer, Crawford, Venango, Erie and Lycoming counties.

Large hunting parties were organized to reduce the squirrel population. In July 1830 one such party in Crawford County killed 891 squirrels in Randolph Township. [42] About 1837 Octavius Hastings "produced over 300 black and gray squirrels which he had shot in the Cussewago bottom within four miles of Meadville, but he had several guns and men to load for him. . . . About 95 per cent were jet black." [43]

Squirrels were a serious menace to grain crops in parts of central and western Pennsylvania until after 1860.

Crows and blackbirds have been pests since the first settlements. The preamble of an Act of 1700 recites, "The innumerable quantities of blackbirds and crows that continually hunt in this province and territories, to the great prejudice, hurt and annoyance of the inhabitants thereof, being very destructive to all sorts of grain that is raised therein, so that the people's labour is much destroyed thereby." A bounty of three pence a crow and an equal sum for a dozen blackbirds was authorized. This was continued for many years but failed to effect any material improvement.[44]

In 1754 the harassed farmers petitioned the General Assembly to pass a law requiring every settler to kill a certain number of crows and blackbirds, for which he would receive compensation. A control method advanced in 1757 failed to meet general approbation: "One Method of keeping Birds from pulling y^r Corn out of y^e Ground is to soak y^e Corn then draw a horse hair thro' with a Needle & tye this. When they get such Corn in to their Craws the hair hangs out of y^e Bill and pesters them so that they often Starve or tear their Throats so as to dye."[45]

An "Act to Encourage the Killing of Squirrels and Crows" in certain counties of western Pennsylvania, passed in 1807 and extended in 1811, authorized county Commissioners to pay three cents each for crow scalps. After 1750 blackbirds ceased to be very destructive but crows continued to be a major pest in spite of all efforts to circumvent them.

Pioneer life was made miserable at times for both man and beast by swarms of mosquitoes, gnats, punkies, horseflies and other insects inseparable from a heavily wood country. Gnats and punkies were particularly vicious in spring and early summer. A pioneer of Crawford County describes his torment: "The gnat was the most troublesome pest to the early settlers; so small as to be almost invisible yet so tormenting as to render it impossible during morning and evening hours or on cloudy days in the summer to do any such work as hoeing, weeding &c., without smoke, movable with the person. Vain were the attempts to sleep unless the entrance to the cabin had the customary protection of a smouldering fire of chips. The exposed skin of a person (if stationary) would instantly appear black, and the pain was of minute sparks of fire."[46]

Livestock, especially cattle and horses, suffered from insect attack even more than humans. Without "gnat fires" their life was unendurable. "The chief plague to horses and cattle," says John Reynolds, "was the large horse fly which drove them in from the woods every clear day about eight or nine oclock. Exposed horses died under the infliction by pain and loss of blood. We made fires of rotten wood and chips and the cattle would run in as the morning advanced and hold their heads and necks in the smoke."[47] As land was cleared and sun-shine reached the ground, punkies, gnats and horse-flies became less troublesome.

HAZARDS OF PIONEER LIFE

Until after 1795 the over-shadowing hazard of pioneer farming was fear of Indian attack. "Every acre, every rod of ground," says John Boucher, "had to be cleared with the ax and held with the rifle." Fear of Indian attack tried even the stoutest hearts. Crèvecoeur gives a dramatic account of this aspect of frontier life: "What makes the Indian incursions still more terrible is that they most commonly take place in the dead of night. We never go to our fields but we are seized with an involuntary fear which lessens our strength and weakens our labour. . . . We never sit down either to dinner or supper but the least noise immediately spreads a general alarm and prevents us from enjoying the comfort of our meals. . . . At night, the howling of our dogs seems to announce the arrival of the enemy; we leap out of bed and run to arms. . . . At last, finding that it was a false alarm, we return once more to our beds; but what good can the kind sleep of nature do us when interrupted by such scenes?"[48] Most frontier families faced possible Indian attack with far more coolness than Crèvecoeur.

Some settlers and their families found sanctuary in blockhouses and forts but the majority were without protection. Harrowing tales of Indian atrocities are part of the history of all frontier counties. Pioneer farmers bore the brunt of Indian ferocity and protected the older settlements of the East from devastation. Their courage and resourcefulness are among the proud traditions of rural Pennsylvania.

The life of a pioneer farm family was hard. Cummings' description of Cumberland County is representative of frontier conditions throughout the state. He traveled "through gloomy forests of tall pines, with here and there a log cabin surrounded by a few acres of cleared land and abounding in children, pigs and poultry." The standard of living was low; the homes were less comfortable and food and clothing more meager than in the older rural districts. There was little incentive or opportunity to make the home attractive or even cleanly, as judged by present standards.

Dirt was the natural concomitant of pioneer life. Fleas, lice, bedbugs and the like found permanent haven in clothing and bedding. These were seldom washed, not only because many of them were skins of wild animals but also because washing was very difficult; it was backbreaking work to carry water from the spring and large kettles for heating water often were not available. Some German pioneer farmers, according to Abijah Hill, lived "in an old log house as black as a smoke house and more dirty than a hog pen . . . with a thousand holes through the roof."[49] In severe winters when the family was snowed in for several months and work out-of-doors was impossible, the discomforts and isolation of pioneer life were accentuated; the whole family was crowded into a single small room for a protracted period.

These unlovely aspects of frontier life were borne of necessity, not of choice. Time was fully occupied in providing shelter and food and in clearing land. The finer things of life had to be deferred until the farm was more productive. This might require several years.

Women on frontier farms had a drab and arduous existence. The cabins had no "conveniences" to lighten their work. "Woman's work" included carrying buckets of water from the spring, splitting firewood, milking cows, making garden, helping in harvests, feeding and clothing the family and rearing a large brood of children. No wonder they died early, to be succeeded by other and younger wives. The record of their sacrifice is written on the tombstones of rural graveyards; many a pioneer farmer rests beside two, three or even four wives who had preceded him to the hereafter.

Some Pennsylvania pioneer farmers suffered from lack of food. The report of Governor Printz for 1647 states, "The reason why so many people died in the year 1643 was that in the commencement of the settlements they had hard work but little to eat." The privation of the Swedes, however, was of short duration. In 1749 Peter Kalm reported, "A venerable septuagenarian Swede, Ake Helm, assured me that in his lifetime there had been no failure of crops and that the people had always had plenty." [50]

In the Bible of one of the first Welsh settlers on the Schuylkill is this account of their experience during the first year: "In the fall of 1682 William ap Edwards . . . and many others settled on the west side of the Schuylkill, six or seven miles distant from the city, there dug caves, walled them and dwelt therein a considerable time, where they suffered many hardships in the beginning. The next season being wet and rainy at the time of their barley harvest they could not get their grain dry to stack before it swelled and it began to sprout, rendering it unfit for bread. They were, in their necessities, supplied by the Indians with venison and wild fowl." [51]

In 1683 William Penn wrote to friends in England, "The greatest hardship we have suffered has been Salt-Meat, which by Fowl in Winter and Fish in Summer, together with some Poultry, Lamb, Mutton, Veal and plenty of Venison the best part of the year, hath been made very passable." In 1686 Thomas Langhorne, who had bought a tract of 860 acres on Neshaminy Creek, Bucks County for £180, reported to friends in England, "The toyle & charge is great to get things into any like order here . . . though I do say y^e Country is a very firtell good Country, as good or better than I expected." [52]

On the western frontier, food was often scanty. Joseph Doddridge tells of his boyhood days in southwestern Pennsylvania, about 1763: "The Indian meal which my father brought over the mountain was expended six weeks too soon, so that for that length of time we had to live without bread. The lean venison and the breast of wild turkey we were taught to call bread. The flesh of the bear was denominated meat. This artifice did not succeed very well; after living in this way for some time we became sickly, the stomach seemed to be always empty and tormented with a sense of hunger. I remember how narrowly the children watched the growth of the potato tops, pumpkin and squash vines, hoping from day to day to get something to answer in place of bread. How delicious was the taste of the young potatoes when we got them! What a jubilee when we were permitted to pull the young corn for roasting ears!" [53]

The first settlers of Bradford County would have starved in the summer of 1791 if "pussley greens" had not been available. "I never saw pussley so plentiful and so big," said one of them, "but the women got so weak from starvation that it took two of them to pull a plant, and when it did come up they would both fall over backwards." [54]

B. Stokely, one of the first settlers of Mercer County, narrates, "In March, 1797, one of my two cows died for want of food. . . . The other was near dying; to save her life I ripped open a pack-saddle pad, took out a part of the straw stuffing, cut it short, put on it warm water and a pint of flour, reserving the residue of the padding for a future day. She recovered." [55]

Benjamin Burt, a pioneer of Potter County, recounts his experiences: "I erected a rude cabin and moved in with my wife and three children on the fourth day of May, 1811. . . . There was not a pound of meat except wild to be had in the county, but there were leeks and nettles in abundance, which, with venison and bear meat seasoned with hard work and keen appetite, made a most delicious dish. . . . We often had to pack our provisions eighty miles from Jersey Shore. Sixty miles of the road were without a house; and in the winter when deep snows caught us on the road without fire we would have perished if several of us had not been in the company to assist each other.

"I had fourteen miles to go in winter to mill with an ox team. The weather was cold and the snow deep. No roads were built and no bridges across the streams. I had to wade the streams and carry the bags on my back. The ice was frozen to my coat as heavy as a bushel of corn. I worked hard all day and only got seven miles by the first night, when I chained my team to a tree and walked three miles to house myself." [56]

A pioneer of Venango County tells his story: "Me and the woman came out on foot, driving one little cow and carrying all our effects on our backs. The first year we ate potatoes and slept on leaves. The first wheat I raised I took a bushel on my back, walked to Pittsburgh, got it ground and carried back the flour. Seed was so scarce that on one occasion when a hen had eaten some melon seeds placed in the sun to dry, the owner cut open the chicken's crop, extracted the seeds and then sewed up the gash, because she could not afford to lose either the seeds or the hen."[57] The hen recovered!

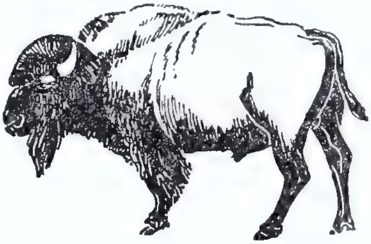
Pioneers in northwestern Pennsylvania experienced a severe setback in 1816, "the year without a summer." There was a killing frost every month. Ice formed one half inch thick in May; there was a three inch snowfall in June; ice formed one eighth inch thick in July. No corn matured. These farmers were able to appreciate the description of Pennsylvania climate by Benjamin Rush in 1789: "Perhaps there is but one steady trait in its character, and that is, it is uniformly variable."

COMPENSATIONS

The hardships of pioneer farming were largely if not wholly offset by its compensations. It developed certain virtues and ideals, chief of which were thrift, self-reliance, love of liberty, close-knit family life and reverence for the Creator. Frontier conditions fostered neighborliness; one could not be a poor neighbor when he was so dependent on others for help in raising his cabin, log-rolling, harvesting and in many other ways. The neighborhood cooperation of pioneer days was one of its greatest social assets.

Time has obliterated all visible evidence of the last resting place of many pioneer farmers, but has deepened our sense of obligation to them:

> The ploughshares
> Cleave softly through the mellow loam
> Where you have made eternal home
> And set no sign. Your epitaphs
> Are writ in furrows.[58]



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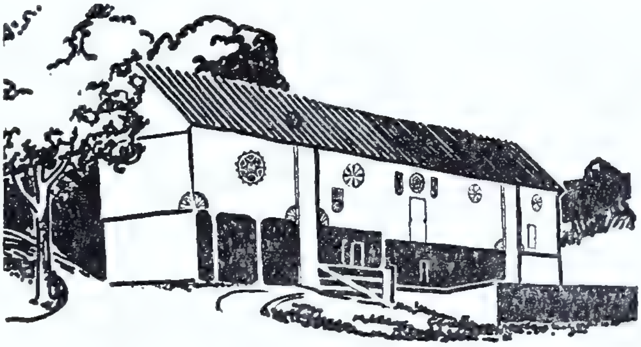


BUILDINGS AND EQUIPMENT

CAPITAL investment in farm buildings was small in pioneer days, of necessity if not of choice. "Stables and cow-houses are seldom seen on farms," says Acrelius. "The animals endure the severity of the winter which, along with rain, frost and snow, is sometimes intolerable. A good farmer has a stable with thin sides for the horses and sheds for cattle and sheep. . . . In milder weather all the cattle run out in the enclosure and are foddered with hay or straw stacks which are set up there." [1]

Barns

Until after 1800 hay and grain were commonly stacked, not stored in barns. In 1749 Peter Kalm reported, "The haystacks are commonly made here after the Swedish manner, that is, in the shape of a thick and short cone, without any cover over it. . . . However, many people, especially in the environs of Philadelphia, had haystacks with roofs which could be moved up or down. . . . The hay was put a fathom or two above the ground on a floor of boards under which the cattle could stand in winter when the weather was very bad. Under this floor were partitions of boards on all sides." [2] This was, in effect, a primitive barn. W. J. Buck, historian of Bucks County, says, "Before 1790 our commodious cellar barns were unknown, as grain was generally stacked."

The reluctance of most English immigrants to build barns was due, in part, to their background of experience. The mild, marine climate and extensive pasture area of England made it unnecessary to house livestock in tight barns; crude sheds or shelters sufficed. The winters of southeastern Pennsylvania, however, were much more severe than those of England. Many cattle died from exposure and hunger. Others were "on the lift" in the spring—so weak and emaciated that they had to be lifted to their feet. Eventually farmers of English stock built tight barns.

German immigrants, on the other hand, built tight barns as soon as they could. They had lived for many generations in a severe winter climate and in intimate contact with their livestock; usually the animals had been housed under the same roof that sheltered the family. Since there was little pasture in the Rhineland, stall feeding was often necessary. Having this background it was natural that one of the first considerations of German farmers was to provide shelter for their livestock. They built great "Swisser" or "Sweitzer" barns. Eventually these were adopted by English and Scotch-Irish settlers also, and became a characteristic feature of the Pennsylvania rural landscape.

The first crude barns of farmers of all nationalities were log shelters six to eight feet high, usually not chinked. The roof was thatched with straw or boughs held in place with saplings or stones. German farmers soon replaced these with substantial bank barns of squared logs or stone, often before they built houses that were equally substantial. "The houses are small and kept in bad order," observed a French visitor in 1795, "but the barns are large and in very good repair." [3] Bernhard Saxe-Weimar was particularly impressed with the barns of Pennsylvania Germans, "which often look better than the dwelling houses; the houses are generally built of wood and not handsome, whereas the barns are generally built of stone, at least the lower parts containing the stabling, and the two gable ends; between these the barn is built of wood." [4] In 1787 Benjamin Rush observed, "They always provide large and suitable accomodations for their cattle before they lay out much money in building a house for themselves." [5]

By 1800 Pennsylvania German barns were famous throughout the nation. These thrifty farmers knew by experience that it paid to keep their livestock comfortable, for the reason stated by Benjamin Rush: "They keep their horses and cattle as warm as possible in winter, by which means they save a great deal of their hay and grain; for these animals when cold eat much more than when they are in a more comfortable situation."

One of the earliest detailed descriptions of the Swisser barn was by John Beale Bordley in 1799: "Farmers in Pennsylvania have a commendable spirit for building good barns, which are mostly of stone. On the ground floor are stalls in which their horses and oxen are fed with hay and cut straw and rye meal, but not always their other beasts . . . the second floor with the roof contains their sheaves of grain, which are thrashed on this floor. A part of their hay is also here stored. . . . A bridge may be built up to this second floor for supplying the want of height in the bank, the wall at one end being built close to the bank of a hill cut down. For giving room to turn waggons within the barn it is built thirty-six to forty feet wide."[6]

The description of a "Dutch" barn given by Charles Trego in 1843 might serve for barns of the present generation: "The pride of a Pennsylvania farmer is his barn, many of which are 60 to 120 feet in length and substantially built, either wholly of stone or the lower story of stone and the superstructure of wood, handsomely painted or whitewashed. The interior arrangement of stables, thrashing floors, granaries, places for depositing hay, etc., is admirably convenient and useful. The horses, cattle and other domestic animals are comfortably sheltered during the winter and, like their master and his family, enjoy the plenty provided by good husbandry and provident industry."[7]

According to S. F. Gladfelter, Pennsylvania bank barns are of two general types, Holstein and Swiss. "The Holstein barn," he says, "is an architectual production of northern Germany, constructed of wood and stone on the order of our so-called bank barns, except that the front roof is much longer in the rear. The name is significant of its construction—*holtz und stein*. The Swiss barn is built without a basement of stone, the wood starting on the ground and the building being smaller. Most of the large barns which dot rural Pennsylvania today are of the *holtz und stein* type, though commonly called Swisser barns."[8]

Many colonial barns, and some much later, were thatched with straw. Writing about the Pittsburgh area, Van Voorhis says, "The barn roof was made with clapboards at first, then of straw and finally of shingles. . . . The straw roof was made of rye straw bound in small bundles by a bark withe and these tied neatly to the woodwork of the roof. The straw roof, well put on, was more lasting than any other roof and to this day (1893) we occasionally meet with one over a half century old."[9]

Bundles of straw for thatching were called "fackels." They were fastened to the roof laths with bands of twisted straw and each row overlapped the row previously laid, from eave to peak. The peak was closed by laying a row of untied straw crossways and holding it in place by poles fastened to the roof with wooden hooks. Straw roofs were cool in summer and warm in winter. The fire hazard, however, was great. They were common in Lancaster County until about 1850.

The designs that ornament many Swisser barns, especially on the south gable, have a significance that reaches back into the Middle Ages. The most common design is a six-petaled tulip, traditionally the most beloved flower of Germans. This motif, along with a wide variety of other flower and star designs, did not appear on barns to any great extent until about 1840, probably because most barns before then remained unpainted. According to some scholars they were not, as many believe, symbols to ward off evil spirits, but were primarily an expression of that marvelous decorative art that lavished itself on nearly every object common to Pennsylvania German life.

Labor and materials being cheap, the cost of early barns was low. Writing from Susquehanna County in 1819 Robert H. Rose says, "Barns are made of framed timber and the sides covered with rough boards. A good barn of this kind, fifty feet long by forty wide, can be built for two hundred and fifty dollars." [10] Another farmer asserted, "Although our house and buildings will cost us $1,000, yet they will be the very best, with one exception only, of any within very many miles of us." [11]

Swedish pioneers often built a two story grain storage of hewn logs with roof of birch bark covered with sod. Grain was stored on the second floor and provisions below. Ultimately a springhouse, smokehouse and woodhouse were built on every well-ordered farm. None the less essential, as viewed at that time, was a malthouse for brewing beer. Later this was superseded by a still house, especially in the western part of the state. The springhouse was used primarily for keeping milk, butter and cheese; sometimes apples were stored in the loft.

One of the chief handicaps in the construction of farm buildings was the scarcity and high cost of nails, hence wooden pegs were used extensively. Wrought iron nails made of soft, malleable iron were hammered out laboriously on small anvils. These had rectangular shanks. Nails were so valuable that some times they were used in lieu of currency. Names now used to designate different sizes of nails were given to them at the time when they sold by the dozen; "ten penny" nails were sold in colonial days for ten pence a dozen. Abandoned buildings might be burned down to recover the nails in them.

In 1796 a nail-cutting and heading machine was invented. A factory for making these "cut nails" was built at Phoenixville in 1809. Machine-made nails soon superseded wrought nails, being much cheaper. The approximate age of old farm buildings may be determined by observing the kind of nails used in their construction.

Practically no farm buildings were covered by fire insurance previous to 1800. The first fire insurance company in America, a joint-stock company, was organized at Philadelphia in 1750 under the title, "Philadelphia Contributionship for the Insurance of Homes from Loss from Fire." Benjamin Franklin was its first President. Not until after the development of mutual companies, about 1840, was any considerable insurance placed on farm buildings.

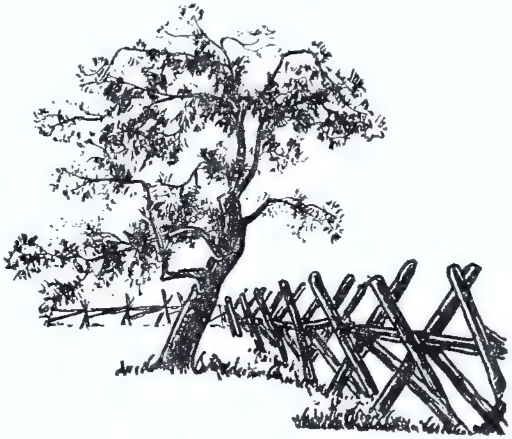
FENCES

In all early settlements livestock was permitted to run at large; ownership of animals was established by brands or earmarks which were registered in county courts. This practice made it necessary to fence all crop land. The Duke of York's Laws, which became operative on the Delaware in 1678, provided, "Every Person interested in the improvement of Common fields enclosed for Corn [all small grain] or other necessary use, shall from time to time make and keep his part of the fence Sufficiently strong and in Constant repair, to secure the Corn." [12] For a number of years farmers in the village of Philadelphia herded their livestock in common, but this cooperative practice soon gave way to individual care.

The Duke of York's Laws provided for the appointment by township officials of "fence viewers," who were to inspect the common fences and had power to see that they were kept in repair. When Connecticut Yankees settled the Wyoming Valley, in 1769, they brought with them the farm practices of New England. Fence Viewers were elected in each township "to see that the fences had no space between the rails of more than a certain width and that they were not less than seven rails high; if the farmer violated the rules in these matters he could not recover damages for the trespassing of other farmer's livestock." [13]

Penn's "Great Law" of 1682 provided, "All Corne-Fields shall be fenced, and all fences shall be at least five feet high, and for Default thereof such persons shall be fined at the Discretion of the County Court." [14] This law was reaffirmed and amplified in 1700: "All cornfields and grounds kept for inclosures within this province and counties annexed shall be well fenced with fence at least five feet high, of sufficient rails or logs, and close at the Bottom. . . . If any horse, kine, sheep, hogs or goats or any kind of cattle shall break into any man's inclosure, the fence being of the aforesaid height and sufficiency . . . the owner of such cattle shall be liable to make good all damages." An act of 1729 provided that a fence was "sufficient" if four and a half feet high, with the lower rail not over nine inches from the ground. [15]

Required fencing of every field so that stock running at large would not ruin crops imposed a heavy burden on farmers. Fields were small and the labor of building and maintaining fences onerous. For many years they were made solely of wood, which was everywhere available, usually of rails ten to twelve feet long. Rails were made by splitting logs in halves, quarters or eighths according to their size. They were laid in zigzag fashion, without stakes or posts to hold the ends in place. About 800 were required to fence an acre. Red cedar rails were preferred because of their durability; they lasted about thirty years. Chestnut, white oak, hickory and ash also were used and sometimes white pine. These "worm" fences



Swede Fence, Berks County.

could be built with a minimum of labor after the rails were split, but they occupied six to eight feet of land and became the haven of weeds and pests.

Some palisade fences were built. Stakes were driven into the ground close together and held by cross pieces tied to them with withes. When land was cleared of stumps these might be used for fencing, being placed close together. In central and western Pennsylvania it was common to fell timber in a line where a fence was desired and to fill in any gaps with the tops and limbs of other trees.

Some pioneer farmers built fences of logs, by means of neighborhood cooperation. "Log fences," says John Lorain, "are built in a direct line, with the ends intersecting and lying close to each other where they join, and these ends are supported by short pieces of small timber split for that purpose. Both worm fences and log fences are good when they have been properly made but it is probable that the latter are more expensive . . . as they do not calculate the extra whiskey and other good cheer introduced on such occasions, nor the labour the farmers are bound to return when their neighbors have to encounter the same work." [16]

The stake and rider fence, a variation of the worm fence, came into common use after 1700. The rails were laid in the same manner as in the worm fence but the ends were held with stakes set at an angle on which a heavy rail rested as a binder.

As timber became less abundant the post and rail fence set in a straight line supplanted the worm fence. The end of each rail was sharpened and placed into a morticed post. This fence conserved timber, occupied a minimum amount of land and favored weed control. In 1828 Bernhard Saxe-Weimar found "the fields of Lancaster County extremely well cultivated; worm fences have been superseded by posts and rails." [17] During the winter farmers cut chestnut trees into six or seven foot lengths for posts and into eleven foot lengths for rails. If white oak was used it was cut in the spring when it could be barked easily and the bark sold to the tannery. Chestnut, cedar and locust posts were most durable.

Logs were converted into posts and rails with a maule and an iron or wooden wedge. Good judgment was required to split them to best advantage. Post holes were chiseled out; later they were bored out with a machine which often was community-owned and passed from neighbor to neighbor as needed. The prevailing price for making rails in 1825 was fifty cents a hundred, with board.

After 1750 increasing scarcity of timber in the vicinity of Philadelphia became a matter of concern to farmers. "What our people will do for fencing and firewood fifty years hence I cannot imagine," said John Bartram in 1763. [18] This led some farmers to plant "live fence," or hedges, which they had been urged to do for many years by visitors from Europe. In 1795 La Rochefoucault protested against "these eternal fences of dead wood which greatly disfigure the landscape" and advocated the planting of thorn hedges, as in France and England.

The peak of interest in live fences was reached about 1810. In 1806 the Philadelphia Society for Promoting Agriculture offered gold and silver medals "for the best experiment on, or practical application of, any species of shrub or tree proper for live fences." The Society stated, "Live fences are of high importance in our older settlements where the timber is daily decreasing and the expense of inclosure becoming so very serious." [19] Many fields near Philadelphia were enclosed with thorn, privet and other species.

Caleb Kirk of Brandywine was one of the warmest advocates of live fences. He argued that it cost only about forty cents a rod to bring them to maturity and one cent annually thereafter for maintenance, mainly pruning. This estimate was far too low. The time required to keep hedges within manageable bounds and the large amount of land they occupied made them impracticable. Moreover, hedges did not thrive as well in this climate as in western Europe.

Another proposed substitute for wooden fences was ditches. In 1788 Brissot de Warville visited the farm of Peter Legeaux at Spring Mill, Montgomery County, and reported, "Mr. Legeaux thinks it best to replace fences, which are expensive, especially in the neighborhood of great towns where wood is dear, with ditches five feet deep, of which he throws the earth upon his meadows, and borders the sides with hedges and thus renders the passage impracticable to cattle." This involved far too much labor to be practical.

About 1815 there was some interest in wire fencing. On January 8, 1816 a paper entitled, "Account of Wire Fences" was read before the Philadelphia Society for Promoting Agriculture. This reported the successful use of such fence "erected at R. Watkins' Tavern at the Falls of the Schuylkill." [20] Wire fence, however, found little favor except among gentlemen farmers, being too expensive. Rail fences were used almost exclusively until after 1840.

OX VS. HORSE

The chief power on pioneer farms was man power. Oxen and horses were used to plow, harrow and haul in hay and grain but rarely if ever for seeding, cultivating, harvesting and the many other operations of farming.

On most farms oxen were preferred to horses. "I have observed," said Benjamin Franklin, in 1769, "that the farmers are more thriving in those parts of the country where cattle are used than in those where the labour is done by horses. The latter are said to require twice the quantity of food to maintain them; and after all are not good to eat, at least we do not think so." [21] Said a Chester County farmer in 1807, "I find that with my two oxen I can do more work than I could with four horses and at half the expense. My oxen go to the lime kiln once a week, twenty-one miles in the morning, and return the next day in the forenoon. After resting two hours they go to work. Horses cannot do this." [22]

In 1824 a Pennsylvania farmer asserted, "Horses are preferable for waggoning on the road, as they can be made to travel quicker and are less liable to lameness. On the other hand, the patient and steady labour of the ox finds no substitute in the horse for the service of the farm and the horse is seldom seen there except in occasional aid of the ox team, or with the light plow between the rows of corn . . . Oxen are kept in a much less expensive manner than horses. In the summer they are uniformly grazed on pastures. In the cold and winter seasons they are put into barns and fed upon stock hay and upon the fodder of corn stalks." [23] Oxen could subsist without grain. When no longer serviceable as draft animals they could be fattened and slaughtered. Yokes were much cheaper than harness. In early days traces and lines were ropes made of hemp, flax, twisted deer skin and sometimes grape vine; hames were made of crooked limbs or roots. Not until tanning became common was leather harness available at a reasonable price.

The slow and phlegmatic ox was better suited for use on hilly or rocky land and on new ground that was full of stumps than the more high-strung horse. Horses were used mainly for riding the treacherous roads of that time, when the use of vehicles was almost impracticable.

When roads were improved, especially after turnpikes were built, horses gradually displaced oxen. The development of horse-drawn machinery, beginning about 1830, completed the displacement of oxen, although many yoke of cattle were kept on hillside farms for several decades thereafter. They were driven without guide lines; at the command of the driver they "geed" or "hawed" or followed the lead of his long whip. Says W. J. McKnight, "Almost all the work on farms in northwestern Pennsylvania about 1824 was done with oxen; and in driving his cattle the old settler would halloo with all his might and swear profusely. This profanity and halloing were thought to be necessary."

CARTS AND WAGONS

The first vehicle of provincial farmers was the crotch of a small tree. This was called a "log boat" or "log sled." The load was carried on the two branches of the crotch; oxen were hitched to the long main stem, which served as a tongue, by means of a ring fastened to the end. There was a rough puncheon floor and a seat. The boards were kept from slipping by wooden pins set in each prong of the crotch. This conveyance was used to haul hay and grain to the barn or stack, grist to the mill and the family to church and social gatherings. Since the "highways" of that period were mere trails, full of stumps and rocks and ungraded, the ride was likely to be a trying experience to women and children.

In mountainous regions a "drag," "sledge" or "sled car" consisting of two poles was used long after wagons were available, these being considered unsafe on mountain roads. One pole was fastened to the hames on each side of the horse, or to a strap which passed around the ox. The rear ends of the poles dragged on the ground. A platform of puncheon boards was provided. A sled called a "pung" was popular in western Pennsylvania; the long runners were saplings which had a natural bend. The horse was hitched to it by shafts fastened to the runners; oxen by a pole.

Cumbersome two-wheeled carts were used by Swedes before the English arrived on the Delaware. The wheels were solid discs of wood sawed from hardwood logs, preferably sweet gum *(Liquidamber)*. They were merely cross-sections of large logs, perhaps three or four feet in diameter and three or four inches wide, and turned on wooden axles. These ponderous carts were almost a load for a yoke of oxen even when empty. By 1730 all the more prosperous farmers along the Delaware had carts of this type.

Four-wheeled wagons did not appear until about 1740. In 1745 there were only ten wagons in Bucks County but by 1750 they were common throughout Lancaster and adjacent counties. When General Braddock was making preparations for his expedition against the French and Indians in 1755, he searched the western parts of Maryland and Virginia for wagons but could secure only twenty-five. Benjamin Franklin, who happened to be in Frederick at the time, informed Braddock, "In Pennsylvania . . . almost every farmer has his wagon." He then published an "Advertisement to the Inhabitants of the Counties of Lancaster, York and Cumberland" and secured 150 wagons and 259 pack-horses within two weeks.[24] The first freight wagon to cross the Alleghenies, in 1789, created a sensation in Pittsburgh.

FARM IMPLEMENTS OF COLONIAL DAYS

The farm implements of early settlers were few, cumbersome and inefficient. Most of them were made by the farmer himself. In 1682 the Secretary of the Dutch West India Company requested that the following implements be sent from Holland to the Dutch colony on the Delaware: "12 ploughshares with coulters, 1 first class wheel plough with its pulleys, 12 two-pronged hay and grain forks, 12 three-pronged do., 100 iron teeth to make harrows, 24 best scythes, 24 good reaping hooks, 50 steeled axes, 20 winnowing fans, 25 wheel barrows, 30 spades, 30 shovels, 30 hoes, 20 iron rakes, 12 hay knives."[25]

Early Swedish farmers on the Delaware had no oxen for plowing for five years after the colony was established, and their poverty in implements was appalling. In 1685 Thomas Budd listed the equipment then considered essential for good farming on 100 acres: "A Share and Coulter, a Plow chain, 2 Scythes, 4 Sickles, a Horse Collar, some Cordage for Harness, 2 Stock Locks, 2 weeding Hoes, 2 grubbing Hoes, 1 cross-cut Saw, 2 Iron Axes, 1 broad Axe, 1 Spade, 1 Hatchet, 1 Fro to cleave Clapboards, Shingle and Cooper's Timber." [26]

The paucity of implements on most farms continued until after 1750. In 1712 the inventory of Robert John, a Welsh farmer of Gwynedd, Montgomery County, listed: "A cart, 3 plows, 1 harrow, 3 hoes, an iron bar, mauls, wedges, axes, spades, shovels, dung-forks, pitchforks, broadax, 2 cross-cut saws, sithes, sickles, 2 grindstones." [27] In addition, rakes, flails, mattocks, sleds, wheelbarrows and augers were part of the equipment of well-ordered farms. Some equipment was owned in common with one or more neighbors. In 1745 a Bucks County farmer bequeathed to a son his "half of the Corn Mill." In 1748 another Bucks County farmer willed "His Part in ye Cider Mill"; and still another, in 1760, "Two Thirds of a cross-cut saw." [28]

The meager equipment of farms in later colonial days is evidenced by the inventory of the goods and chattels of Andrew Ferree, a prosperous farmer of Lancaster County, who died in 1735:

To great waggon, £9; little waggon, £5	£14-0-0
To a plow and two pairs of irons	1-0-0
To two mauls and three iron wedges, 9 s.; to four old weeding hoes, 4 s.	0-13-0
To two broad-axes, 12 s.; to joyner's axe and adz, 6 s.	0-18-0
To sundry carpenter tools, £1; sundry joyner's tools, 2£-5 s.	3-5-0
To seven duck scythes	0-12-0
To four stock bands. two pairs hinges, sundry old iron	0-14-0
To a hand-saw, 2 s.; to five sickles and two old hooks	0-11-0
To a cutting-box, two kimes, £1; to twenty baggs, £2-10 s.	3-10-0
To two pair chains, 14 s.; two hackles, £1-10; to five bells, 12 s.	2-16-0
To four small chains and other horse gears	1-4-0
To other horse gears at £1-10 s.; to a man's saddle at £1-10	3-0-0
To three falling axes at 10 s.; to two fowling pieces, £2	2-10-0
To four working horses, £24; to a mare and two colts, £11	35-0-0
To six grown cows at £15; to ten head of young cattle, £13-10	28-10-0
To eleven sheep, £3-17; to swine, £1-10	5-7-0

Iron was scarce and dear. Many farm implements were made entirely of wood, including plows, harrows, forks, shovels and other hand tools and appliances. About the only metal available was bog-ore, which was brittle and broke easily. Scarcity of metal and prohibition of the exportation of forges and metal-working equipment from England to her colonies delayed the manufacture of metal farm implements in America for many years. After 1740 the iron smelting industry developed rapidly, being encouraged by the demand of British manufacturers for pig iron.

The process of casting steel was discovered at Sheffield, England, about 1750. In that year Parliament passed an Act forbidding the

"Erection of any Mill or other Engine for Slitting or Rolling of Iron; or any Plateing Forge to work with a Tilt Hammer, or any Furnace for making Steel in any of said Colonies."[29] A common sarcasm was, "It is not lawful to make anything in America more valuable than a hob-nail." But American business and inventive genius was not to be denied opportunity for expression. A few iron-shod plows and iron-toothed harrows were imported but soon Pennsylvania farmers began to make metal implements themselves, in spite of the ukase of Parliament.

At first, implements were made on the farm, then by local blacksmiths and eventually by small manufacturing industries in rural communities. Colonial farmers were, of necessity, jacks of all trades. They were especially adept at working with wood. Many had a small blacksmith shop in which to make their own implements. In every rural neighborhood, however, some man developed more skill in fashioning tools than his neighbors. He became the local blacksmith and plow-wright; his implements were used locally almost to the exclusion of all others. If exceptionally skillful, his products acquired more than a local reputation; plows made by Smith Brothers of Bucks County were sought by farmers throughout southeastern Pennsylvania.

The output of each local craftsman was limited. Said Judge Richard Peters of Philadelphia in 1809, "If any agricultural implements are found good, they are not easily multiplied or readily obtained. . . . If a mechanick is celebrated for his skill, he has more demands than he can fairly supply. . . . No manufactory of agricultural instruments in general exists; and much embarassment, delay and difficulty are found in the collection from various and distant places and from workmen of various character and capacity of all the implements of husbandry required for even common operations."[30] He recommended that "a manufactory of agricultural implements be established under the patronage of the Society." After further consideration, however, he concluded that this should be left to private enterprise. Not until after 1830 was there any considerable development in the commercial manufacture of farm implements.

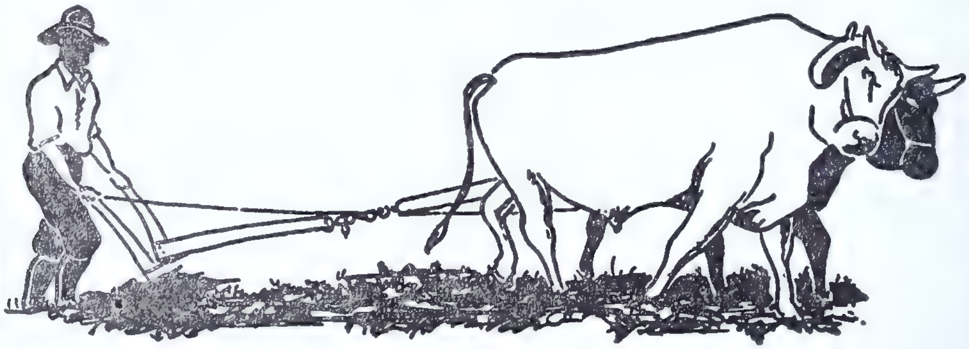
TILLAGE IMPLEMENTS

Until about 1790 plows used by Pennsylvania farmers were little better than those used by their ancestors in Europe and Asia thousands of years before. They were heavy, cumbersome and very inefficient. The early colonial plow had a wooden beam, wooden moldboard and landside and one or more wooden coulters. One or two crooked sticks served as handles. The moldboard was straight, not curved. Its cutting edge might be reinforced with strips of sheet iron or tin. The moldboard often was three of more feet long but very shallow, so that it stirred the soil only a few inches deep. Friction was very high and the drawbar pull heavy, even when the beam was supported by wheels; the draft was several times that of modern plows. The "Old Colony" plow, which was used considerably in Pennsylvania up to 1820, "had a ten-foot beam and a four-foot landside;" and made "furrows stand up like ribs of a lean horse in the month of March." [31]

It required a strong man to hold such a plow. Ordinarily two or three men, a boy and four to six oxen were needed to operate it. One man held the handles, another held down the beam so that the plow point stayed in the soil, a third drove the oxen and the boy kept sod, stubble and weeds from clogging the plow. It was necessary to clean the moldboard frequently with a "plow-staff" for it did not scour well. There was no uniformity of plow design and construction; every farmer, blacksmith and plow-wright had his own ideas about this. The shape of the moldboard, especially, was likely to be defective. After the business of making plows passed from the farm to the local blacksmith shop nearly every community had a plow design peculiar to itself.

Thomas Jefferson was first in this country to attempt to develop principles of construction that might serve to standardize the design of plows. He used a spring dynamometer to determine the comparative draft of plows of different designs. He reported his findings in 1799 to The American Philosophical Society together with a design for an improved "moldboard of least resistance." [32] This was the first important paper in America on the application of science in the design of farm implements. In 1816 he communicated to the Philadelphia Society for Promoting Agriculture a description and figure of a hillside plow with a shifting moldboard. [33] Plows embodying his principles of moldboard design were made in quantity after 1800.

Pennsylvania farmers and craftsmen made many important contributions to plow design. At a meeting of the American Philosophical Society in 1768 "Dr. Williamson acquainted the Society that he had received from Mr. Joshua Gee of Gainesborough in England the description



of a Plough which he believed would be of great use in this Country & that he had a Model of the Plough."[34] This communication was referred to the Committee for Mechanics and Husbandry, from whose files it never emerged.

In 1740 James Small of Scotland patented a plow with a cast iron moldboard and wrought iron share; and in 1785 Robert Ranson of England was granted a similar patent. Previous to the Ransom patent, however, "William Ashmead of Germantown made a plow with a wrought iron mouldboard instead of the customary mould. This great improvement was much admired by General Lafayette, who purchased four of them for his estate, La Grange. This improvement was soon adopted by another person who made the mould board of cast iron."[35]

The first inventor and patentee of a cast iron plow in America was Charles Newbold, a business man of Philadelphia who lived a few miles away at Mt. Holly, New Jersey. In 1797 he was granted a patent on a plow in which the moldboard, share and landside were cast in one piece at his Hanover, New Jersey furnace. This plow attracted the attention of Thomas Jefferson and other leaders but farmers were skeptical about it, not only because of the high cost but also, as they said, because "iron poisoned the soil and encouraged the growth of weeds." They continued to use wooden plows.

To Robert Smith of Pineville, Bucks County, belongs the credit for first designing and patenting a practical cast iron plow which embodied the principles of moldboard construction developed by Jefferson. Being dissatisfied with the poor work of their wooden moldboard plow he and his brother Joseph collaborated in developing a more efficient implement. Robert was the designer and Joseph the construction mechanic. They experimented with numerous designs for several years. In 1797 they took a wooden model to Philadelphia and employed Charles Newbold to make castings of it in his foundry near Camden, New Jersey. Patent on their design was issued on May 19, 1800 in the name of Robert Smith.

The Smith plow was an immediate success. In 1802 the brothers built a blacksmith shop and foundry on their farm. By 1810 their little farm shop was taxed beyond its capacity to fill orders and they employed a Philadelphia firm to make 1200 cast iron moldboards annually. For a few years they received a royalty of $1.00 a plow from foundries elsewhere that made plows according to their design. Soon, however, their patent rights were disregarded and royalties ceased. Later the business was carried on by a son, Mahlon Smith, who made some improvements in the original design. It was then known locally as the Mahlon Smith plow.

The Smith plow was widely used in Pennsylvania and New Jersey for fifty years. In 1880 Eastburn Reider of Bucks County reported to the State Board of Agriculture, "Many of the Mahlon Smith plows are still in use and are considered by their owners as the best plows." Benjamin Wiggins of Bucks County made further improvements on the Smith plow. In 1880 the Wiggins plow was reported as "having wide celebrity as well as a home reputation. It may be justly styled 'the Bucks County plow'." [36]

September 1, 1819, when Jethro Wood of Scipio, New York was granted a patent on his design, usually is considered the natal day of the modern plow. Sufficient credit has not been given, however, to Robert and Joseph Smith who designed and put into wide use an efficient cast iron plow nineteen years before the Wood plow came into existence. Letters patent of the Smith plow and some old models of it are in the library and museum of the Bucks County Historical Society. [37]

A number of other serviceable plows were developed in southeastern Pennsylvania. These were listed by Gilbert Cope in 1880: "In 1814 John and Joshua Butler of Brandywine Twp., Chester County, obtained a patent for a bar-share plow. . . . Thomas Peacock of Willistown, in 1820, was a maker of plows. But the inventor who did the most for the country was Bernard Wiley of Kennett Square. . . . In 1830 he and James H. Conchlin of Peekskill, New York, obtained a patent for a cast iron plow share. . . . The Wiley plow has been a general favorite. . . . There are still many farmers who believe the Wiley will not be permanently driven from the field by anything which has yet appeared." [38]

In 1808 William Bakewell of Flatland Ford, Montgomery County, was using to advantage a "three furrow plow consisting of three shares and the mould plates of iron fixed in a frame, so as to follow each other at nine inches distance, by which means twenty-seven inches of land are ploughed at a time. It is drawn by three horses abreast and has two wheels to regulate the depth." [39]

The cast iron plow patented by Jethro Wood in 1819 was the culmination of improvements in plow design made by Smith brothers and many others. It marked a great advance in design and construction. The parts most exposed to wear were replaceable; if a point, moldboard or landside broke it could be replaced without buying a new plow. The shape of the moldboard was improved so that it pulverized the furrow slice. Friction was reduced. Guidance was facilitated so that a man could plow an acre and a half a day. It was a notable contribution to agriculture. Yet so prejudiced were farmers in his neighborhood against metal moldboards that he had to give away his plows in order to have them tried. Jethro Wood derived no profit from his invention and died in poverty.

After the introduction of the Wood plow several patterns were developed for special purposes, as for plowing clay soil or sandy soil. Plow making began to leave the local blacksmith shop and became a factory industry. Pittsburgh became a center of the manufacture of agricultural implements. In 1829 a plow factory using steam power was established there. Another factory in that city made 4,000 plows in 1836. About 1837, steel moldboards began to displace cast iron moldboards; they scoured better.

Deep plowing and subsoiling, or "trench ploughing," became popular about 1825. John Hare Powel of Philadelphia was an ardent advocate of subsoiling. In 1827 he reported, "This day with Wood's Plough No. 2 drawn by four oxen my land has been ploughed for mangel-wurtzels more than fourteen inches deep." [40]

From 1810 until 1830, when nearly every rural community had its own favorite locally-made plow, plowing matches were one of the most popular agricultural contests. Usually they were sponsored by county agricultural societies which then were being organized all over the state. The announcement of a meeting and exhibition of the Agricultural Society of Bucks County in 1824 states, "It is proposed to have a plowing match on the same day—a suitable piece of ground will be provided to test the qualities of the different kinds of ploughs. The neighboring farmers who have any of superior construction are invited to come forward." The committee appointed to judge this match reported the winner: "Enos Morris' plough drawn by two horses, William Austin, ploughman, ploughed 3/16 of an acre of herd and timothy sward 7 inches deep in 24 minutes . . . in a superior and handsome manner." [41]

In early colonial days the harrow was about the only other tillage implement to which horse or ox power was applied. Iron-toothed harrows were in use in Europe at the time of the settlement of Pennsylvania and a few teeth were imported, but most colonial farmers used wooden pegs in triangular or A-shaped home-made harrows. Two small logs six to eight feet long were joined at one end and braced in the middle. The pegs were ten to fourteen inches long, of hardwood, and were fitted into holes eight to ten inches apart. The A-harrow was particularly serviceable on new ground. After 1750 iron teeth were hammered out by the local blacksmith but the farmer made the frame.

No other type of harrow was in common use until after 1840. In pioneer farming a make-shift harrow called a "drag" was used considerably. Several small, twiggy trees, as birch, were fastened to a head-piece and dragged over the ground. The drag was particularly useful for covering grain and grass seed, especially on light soils.

Until after 1840 most small grain and grass seed was broadcasted by hand and harrowed in. A common method of sowing grass and clover was to broadcast it on wheat in late winter when snow was still on the ground so that the footprints of the sower could serve as a guide. Corn, also, was hand-planted.

Between 1800 and 1840 American mechanical ingenuity was at work on the design of drills and planters and several crude types were introduced.

Jethro Tull of England was first to drill wheat. His *Horse-Hoeing Husbandry,* published in 1733, describes and illustrates a drill which sowed rows of seeds from narrow coulters or hoes. The principle was a revolving cylinder fitted with changeable cavities for the reception of seed. The implement was drawn by one horse. Drilling wheat was not generally practiced in England for many years after the death of Tull but eventually the practices that he advocated worked an agricultural revolution.

About 1752 Jared Eliot, a preacher-farmer of Connecticut, with the aid of a local wheelwright, improved the Tull design so that the implement was easier to operate. His drill opened furrows, dropped seed evenly and covered them in a single operation. Eliot sent one of his drills to William Logan of "Stenton," near Philadelphia, who reported on July 25, 1754, "I think it might answer if it were possible to persuade farmers to use it." [42] Probably this is the drill mentioned by the anonymous author of *American Husbandry* in 1775 as being in use in Pennsylvania.

In 1786 George Morgan of Princeton, New Jersey, an active member of the Philadelphia Society for Promoting Agriculture, designed another grain drill. It found little acceptance for reasons stated by one who tried it: "In turning, the driver has only to hold the wheel on the side he turns in order to prevent shedding of seed in turning. It is necessary to have a boy watch the drill to see that it sheds the seed, as sometimes it will choke. . . . If the ground be wettish the driver must stop and open the passage with his finger or a bit of stick." [43]

The next drill to appear in Pennsylvania was the "American Wheat Drill," invented in Sussex County, New Jersey, but made at Downingtown, Pennsylvania. In 1814 John Lorain of Philipsburg reported on its operation: "One horse, a man and an active boy were found sufficient to drill at the rate of six acres per day; the boy leads the horse and the man, walking behind, observes the delivery from the funnels lest anything accidentally mixed among the seeds should retard or stop the delivery; and also to clear away from the coulters any rubbish they may gather." [44] It was necessary to follow this drill with a harrow to cover the seed.

Not until 1841 was a grain drill successfully used in Pennsylvania. On March 12 of that year Moses and Samuel Pennock of Kennett Square patented a drill that was widely used in Chester County and southeastern Pennsylvania until about 1870. The Pennock drill had seven hoes nine inches apart and covered the seed. One man and two horses could seed ten to fifteen acres a day.

Until after 1850, however, most small grain was broadcasted. The land was plowed twice, the second plowing being quite shallow. The grain was harrowed in the same direction as the last plowing; this threw it more or less into rows and it was less likely to freeze out. After the drill came into general use the second plowing was discontinued but the land was harrowed and rolled before seeding.

Until after 1850 corn was dropped by hand and covered with a hoe. Some farmers plowed a furrow and dropped the seed in it. On new ground the Indian method might be used—striking an axe or hoe into the soil to make a hole; or a spade might be inserted and pressed backward and forward in the soil.

A few crude corn planters appeared soon after 1800. In 1819 John Conrad of Lampeter Township, Lancaster County, described and figured a planter that he had invented "which has been found by the experience of my neighbors and myself for two years past to be extremely useful in facilitating the planting of corn in an improved manner. . . . Ten acres have been planted in one day by my machine without any person furrowing." [45] As usual, the inventor was over-sanguine. Hand corn planters began to supersede the hoe, axe and spade about 1840 but efficient horse-drawn planters did not appear until after 1850.

Wheelbarrow sowers for grass and clover seed were in common use after 1820 and did much to popularize the culture of red clover. In 1818 George Logan reported, "Many of our husbandmen are discouraged . . . in sowing an extensive field with clover and light grass seed by hand . . . I have received one of Bennett's machines for sowing. . . . It exceeds my most sanguine expectations. A man pushing the instrument before him in the same manner as using a wheelbarrow will sow twenty acres per day, uninterrupted by wind or a light rain." [46]

Corn and other row or hill crops were not cultivated before 1800; these crops were either "plowed out" with a shallow plow or the weeds chopped out with a hoe. Cultivators, or "horse-hoes," were used in England before the settlement of Pennsylvania but did not become popular here. The Indian method of hand-hoeing between the hills seemed preferable, or the interspaces were plowed out. The author of *American Husbandry* says that a few cultivators were in use in 1775. [47]

About 1812 Richard Peters of Philadelphia "contrived an improved horse instrument which is wonderful in extirpating weeds and lightening the earth. The frame is triangular and the 12 iron shoes or hoes are so disposed that no two of them pass over the same point, and the whole cleans a breadth of about four plow furrows. There is a wheel set forward which may be raised or depressed; this regulates the working depth." This "Peter's Horse-Hoe Harrow" soon was superseded by lighter implements. By 1840 these had largely displaced the shovel plow for working between crop rows.

From the earliest settlements, rollers were used to crush clods and compact soil around grain and grass seed. Pioneer rollers were merely smooth logs drawn by ropes attached to pins inserted into the ends of the logs. Hollow wooden rollers made of heavy planks nailed to a round frame were a later development.

HARVESTING EQUIPMENT

The farm labor problem, always serious in colonial Pennsylvania, was most acute at grain harvest and placed a definite limitation on the grain acreage of a farm. Until about 1780 most small grain was harvested with the sickle. This is one of the most ancient of farm implements: "Thou shalt not move a sickle in thy neighbor's corn," commanded Moses.

The colonial sickle was but little changed from that used by the Israelites and Babylonians and by countless generations before them. It had a saw-tooth edge; grain was cut by pulling it across the stalks, not by cutting it as with a scythe. The cut grain was raked into bundles, tied and shocked. Grain harvest was slow and tedious work. Richard Peters of Philadelphia reported to George Washington that a reaper would average three quarters of an acre a day, but in heavy grain not more than half an acre.[48] In 1795 Tilton wrote, "A man can cut an acre of wheat with a sickle in a day." It was customary for reapers to gather in companies of twenty-five to seventy-five or even more and move from farm to farm. Neighbors took turns helping each other at wheat harvest.

About 1780 the cradle began to replace the sickle; but as late as 1840 some Pennsylvania farmers still clung to the sickle, although admitting that the cradle was more efficient and less back-breaking. Grain that was lodged by storms, making it difficult to lay the straw straight, was reaped with the sickle. In 1832 two-thirds of the wheat in some townships of Chester County were still harvested with the sickle.[49]

The grain cradle was several centuries old when it came to Pennsylvania. The farm inventory of Jenkin Jenkins of Gwynedd in 1745 listed "a cradle and 4 sickles."[50] The cradle was essentially a scythe with a broad blade attached to a light frame and four wooden fingers of about the same length and shape as the blade. The grain could be cut and gathered at the same time; by a dexterous turn of the cradle to the left the reaper threw it into a swath, ready to be raked and bound into sheaves. Farmers required that the cradle be light but strong and that it have the "right hang." A skillful cradler could average two to two and a half acres a day. The champion cradler of Pennsylvania in 1858 was Michael Cromer of Franklin County; between sunrise and sunset he cradled twelve and a half measured acres, comprising "365 dozen shocks of wheat yielding, when threshed, 262 bushels of grain. The labor of four men was required to bind after him."[51]

The most important event in the history of agricultural machinery in America was the invention of the reaper. In Europe, where land was dear, crop production was limited by the amount of land available; in America, where land was cheap, by the amount of labor available. This was especially true of small grains.

In 1833 Obed Hussey of Ohio and in 1834 Cyrus H. McCormick of Virginia were granted patents on reapers. The Hussey machine was demonstrated near Pittsburgh in 1837 but it was inferior in design to the McCormick reaper and was abandoned after the latter was manufactured. Until after 1850, however, reapers were merely an object of curiosity to Pennsylvania farmers. Only 3,000 McCormick reapers were made in 1850, not enough to have any appreciable effect on the wheat harvest of the country.

This lag in utilizing one of the greatest labor-saving devices of agriculture was due not only to problems of manufacture but also to lack of demand. Farmers were skeptical about the practical operation of the reaper. They also were prejudiced against it because "it would throw many men out of work." In a few instances it was necessary to keep the machines under lock to prevent farm laborers from destroying them.

The McCormick reaper was first given a field trial in Pennsylvania in 1840 on the farm of Frederick Watts of Carlisle. "It was in the summer of 1840," relates Judge Watts, "that I brought it to my farm. I determined to test its power in a twelve-acre field that would yield at least thirty-five bushels per acre. . . . There were present from five hundred to a thousand persons anxious to witness the signal failure of 'Watts' Folly,' as they called the machine. After two or three rounds the spectators unanimously agreed that the machine was a complete success."[52] The McCormick reaper was first used in Lancaster County in 1851 and in York County in 1853. By 1860 it was established as necessary equipment on most of the larger farms.

THRESHING EQUIPMENT

Until the advent of an efficient threshing machine, about 1840, most small grain was threshed with the flail. This had been used in the Old World for centuries. It was hand-made. The "staff" was of oak and the "club," "break" or "supple" of hickory. The two pieces were joined with a strip of leather.

Threshing usually was done on the barn floor. One to four men laid sheaves head to head, threshed them, turned them over and threshed them again while still bound. Then the sheaves were unbound and threshed again, turned over and threshed once more. Thus sheaves were threshed four times. Flailing required a certain knack which was attained only after considerable experience and perhaps a sore head occasionally. Usually two men flailed together. The rhythmic thwack of the breaks on the threshing floor, which resounded like a drum, could be heard a long distance; it was one of the characteristic early winter sounds of rural Pennsylvania. Sometimes the threshing floor was packed clay soil out of doors. A good day's work was ten bushels of wheat or twenty of oats per man. Men who traveled about the countryside threshing on shares received one bushel in ten, and board.

Flailing was more efficient in removing grain than treading, and utilized the time of the farmer and his sons during the winter months, but it was cold and tedious work. On large farms nearly the entire winter might be required to thresh the crops. Flailing damaged straw less than treading; straw was valued not only for bedding livestock and for winter fodder but also for bedding the family and for thatching roofs. The farmers of Babylon and Egypt, forty centuries earlier, threshed grain about as rapidly as Pennsylvania farmers did before the introduction of the threshing machine.

Some grain was trodden out by farm animals, as had been done before the dawn of history. Treading was more common in states farther south than in Pennsylvania. The sheaves were hauled to stacks near which a threshing floor was built, either of plank or of packed clay. Sheaves were strewn around the floor and unbound, then horses or cattle were driven over them, round and round many times. After the heads were well cleaned of grain, the straw was thrown aside, the grain swept up and more bundles spread.

There was some prejudice against treading out grain because the process was uncleanly. "Many farmers still shift their Treading Floors from Field to Field," said John Beale Bordley in 1786, "from whence much rough-feeling, dirty wheat goes to Market. Those who have a proper Waxy Earth which becomes glassy by treading Wheat upon it and who always tread on the same Place will have no more dirt in their wheat than the Thresher who beats it out on Plank; provided they are attentive in taking Horse dung as soon as it is dropped on the straw (which in a proper Method of Treading is not easily done)." [53]

Treading was less laborious than flailing but much more unsanitary. In later years it was practiced only by farmers who had good barn floors. A common method was to lay the sheaves in a circle, unbound. Then a boy rode one horse and led another over them, round and round. Dizziness was prevented by frequently reversing the circuit. A man stood in the middle to turn over the straw. Fifteen bushels of wheat and thirty of oats could be treaded out in a day. On very large farms the method used by John Beale Bordley was followed: "Twenty-four horses, six in each of four equidistant ranks or radial, gently trotting on the wheat sheaves round a circle of 400 feet circumference trod out 200 bushels medium in a day. One day, 416 bushels, the horses being driven hard on a wager of the overseer." [54]

The first recorded attempt to develop a substitute for flailing and treading in Pennsylvania was made by John Clayton in 1770. In that year the General Assembly passed "An Act to invest John Clayton with an exclusive privilege and benefit of making and selling a machine for threshing wheat on a model made by him." [55] Fortunately the monopoly thus granted so carelessly was not exercised since the machine did not substantiate extravagant claims of its inventor.

The second attempt was recorded by Judge Bordley: "In 1782 Colonel Anderson, then of Philadelphia, now residing on the Susquehanna near Lancaster, invented a mill moved by horses for threshing wheat and other grains. In 1791 he built one of full size which (on trial of it) I saw work to advantage." [56] On further test, however, this machine was found wanting.

A threshing machine that had been patented by Andrew Meikler of Scotland in 1786 was used by David Prentis in 1806 at the mill of David Witmer, Lancaster County. It was said to be capable of threshing thirty-five bushels of oats an hour and of threshing and cleaning 100 bushels of wheat in eight hours. A committee of Lancaster County farmers testified, "Having seen it in operation, the machine will answer the purpose for which it is intended to the fullest extent." [57] This thresher, likewise, failed to live up to expectations.

As recorded by Gilbert Cope, "In 1827 Moses Pennock of East Marlborough obtained a patent on a vibrating threshing machine. This and several other types of one-or two-horse power threshing machines could thresh 100-150 bushels a day." [58] One of the best of these early stationary horse-power machines was the "Pitt thresher," which cost $200 and had a capacity of 100 bushels a day. About 1832 William Kirkpatrick of Lancaster County began to manufacture a portable horse-power thresher which was used considerably. It had spiked cylinders working into spiked concaves and was geared to be powered by four or more horses.

In 1842 Andrew Rolston of Hopewell township, Washington County, patented a thresher which was widely used in southwestern Pennsylvania. It was manufactured at West Middletown by Robert B. McClure and was known as the McClure thresher. [59] It both threshed and winnowed grain. At first it was operated by horse power, later by steam.

These early machines effected a considerable saving in the time and cost of threshing but many farmers were loath to use them. They advanced the argument that had been used against every new labor-saving device from time immemorial—that it "took the bread out of the laborer's mouth." Eventually, however, even farm laborers admitted that the thresher was an advance over flailing and treading.

Threshing machines would have supplanted flailing and treading much sooner if cheap and efficient power had been available on farms. Windmill power was too uncertain and water power was not available on many farms. Steam power, which was first used on Pennsylvania farms about 1800, was expensive. The best available power then was "lever power," in which a large horizontal cogged wheel was turned by horses or cattle on a turn-stile. Not until the introduction of portable "tread power," about 1835, did threshers become common. This was an inclined rolling platform on which horses and cattle walked, thereby revolving a fly wheel attached to the cylinder of the thresher. This outfit cost about $200 and had a capacity of 150-200 bushels a day. A threshing crew was commonly three men and two teams. After 1850 a number of steam power threshers traveled about the countryside and threshed about 500 bushels a day.

Winter was almost as busy a time for colonial farmers as summer, for the crops of small grains not only had to be threshed but also winnowed to remove chaff and dirt. At first this was done by tossing shovels-full of grain against the wind and then passing it through sieves. Another method was to hold grain in the hand in a brisk breeze and shake it as it fell through the fingers to a receptacle on the ground. To "raise a wind" when there was none, two men held a linen sheet at the corners and gave it a semi-rotary motion or sudden swing; the resulting movement of air would blow chaff from a pile of wheat on the floor which was constantly stirred by a third man. Grain was cleaned by passing it through two splint-bottom hand riddles—one coarse, the other fine. One man shook the riddle while the other two operated the breeze-raising sheet in front of it. They could winnow ten to fifteen bushels a day.

The first Pennsylvania farmers to produce an artificial wind for winnowing grain were considered by some as "impiously invading the domain of Providence." [60] Crude fanning mills, turned by hand, were introduced about 1750. In 1766 the inventory of the estate of Matthew Hall of Marple listed a "Fann for cleaning grain, 3s. 6d." This was a "Dutch fan" which had been invented in Holland about 1665 but did not reach England until around 1710 and her colonies some years later. Dutch fans were in common use until about 1840 when horse-power threshing machines began to do the work more expeditiously.

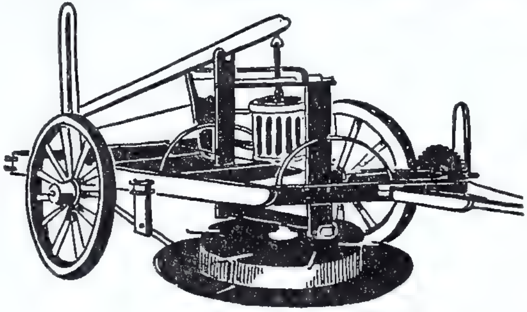
Another tedious job for colonial farmers was shelling corn. Until after 1840 this was done mostly by hand. "Farmers shelled much of their corn by placing the sharp edge of a spade over a half bushel measure or a sawed-off barrel, then sitting astride the handle and pulling the ear over the edge of the spade. If there was much to be shelled they would spread it on the barn floor and tramp it off with horses or thresh it off with a flail." [61] On February 19, 1807, the *General Advertiser* of

Philadelphia carried an advertisement of a locally-developed "Patent Shelling Machine" which was said to shell 100 bushels of corn a day, and was operated by horse or water power. It failed to meet expectations.

HAYING EQUIPMENT

Grass was cut with a scythe until after 1840. There were two kinds of scythes, English and German or "Dutch." The blade of the English scythe was of hard steel and was sharpened on a grindstone and with a whetstone. The blade of the German scythe was shorter and broader and was made of soft metal; it was sharpened by pounding it on a miniature anvil—*dengled-dengled* on a *denglestock* then whetted. The anvil was about four inches long and one quarter inch thick. It was taken to the field and fastened to a log or stump. The mower also took, hooked to his girdle, an ox-horn half full of water. This was his *koompf* in which he kept his whetstone damp for most effective use in temporary sharpening of the blade.[62] The German scythe was better suited than the English for mowing irrigated meadows of native grasses, which were common until about 1810. When these were supplanted by upland fields of timothy and red clover the English scythe came into general use. An acre was considered a good day's mowing for one man.

The mowing machine did not supplant the scythe until after 1840 although a number of designs were patented before then. In 1822 Jeremiah Bailey of East Marlborough, Chester County, obtained a patent on a horse-drawn mower. His advertisement in 1825 was couched in the sanguine language of the inventor: "Jeremiah Bailey begs leave to state to farmers his belief that the machine which he has invented . . . is the cheapest and most expeditious mode of cutting grain and grasses. . . . When the grass is heavy and much lodged it is believed that this machine will be equal to the labour of twelve men; where the grass is lighter, to that of six men."[63] An eye-witness of a field trial of the Bailey machine described it as "a cross between a war chariot and a saw-mill, with a circular saw which went charging at the lines of plumed timothy stalks, or halting when a cog slipped or a knife broke off on striking a stone. . . . The field had to be level as a lawn, for whenever the cutter shaft got into a rut the knives would strike dirt and choke down."[64]



Mowing machine with circular blade invented by Jeremiah Bailey, Chester County, in 1822.

Ezra Cope of East Bradford, Chester County, and his nephew, Thomas Hoopes, "made some improvements on the Bailey machine . . . and on May 18, 1825, received a patent thereon. Fifty or more of these machines were made . . . and were tolerably successful."[65] Several committees of Pennsylvania farmers were appointed to appraise it and made favorable reports, but its weaknesses were obvious. The back-breaking scythe held almost full sway for another generation.

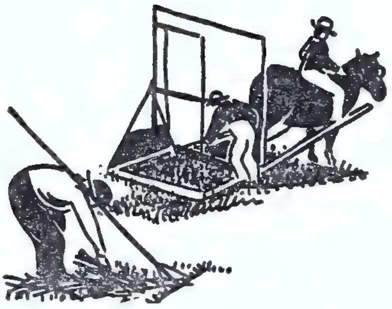
After 1815 farm-made, horse-drawn rakes superseded hand rakes. These were of several designs, about ten feet wide with ten to fifteen wooden teeth. They were not mounted on wheels but were dragged over the ground with ropes. Guide handles were used to lift them. In 1825 it was reported, "The horse hay rake is in very general use in most of the eastern counties of Pennsylvania and in New Jersey, with which they can rake as much hay and grain and glean the grain stubbles as fast as seven men can with the hand rake."[66] The steel-toothed horse rake did not come until after 1840.

In 1822 Moses Pennock of East Marlborough, Chester County, one of the most ingenious and most enterprising makers of farm machinery of his time, obtained a patent on a revolving wooden hay rake. This was popular locally for a number of years.

HAND TOOLS

Between 1740 and 1840 hand tools were greatly improved in both effectiveness and lightness. The "broad hoe" of early colonial days, which taxed the strength of a man, gave way to a much lighter and more serviceable implement. The clumsy "pole ax" of the pioneers was superseded by a lighter and better tool. Double-bitted axes came in about 1825. Wooden shovels, spades, scoops, forks and other hand tools were banished to the attic and replaced by lighter and better designed implements having steel blades or tines. Pittsburgh became the center of farm tool production in America. In 1831 steel hoes were made there for $4.50 a dozen, which was half the price of hoes ten years earlier. In 1836 two factories in Pittsburgh made 1,600 dozen steel hoes, 8,000 dozen shovels and spades, 950 dozen steel hay and manure forks and 600 dozen saws.[67]

The transformation of Pennsylvania agriculture from hand labor to a high degree of mechanization was not complete until after 1840, but a substantial beginning was made before then, particularly in the substitution of horse power for man power. At the beginning of the eighteenth century the only implements to which horse power was applied were the plow, harrow and two-wheeled cart. By 1840 the cultivator, hay rake, reaper, thresher and four-wheeled wagon had been added. Stimulated by the tariff law of 1828 and by the industrial revolution, factory production of farm implements increased rapidly. The end of the manufacture of farm implements in local blacksmith shops was in sight. The new order had begun.



McCormick reaper, 1840

V

LABOR

SO VAST is the territory of North America," wrote Benjamin Franklin with his usual keen insight, "that it will require many Ages to settle it fully; and till it is fully settled, Labour will never be cheap here, where no man continues long a Labourer for others, but gets a Plantation of his own." Throughout colonial days farm labor was inadequate and costly, mainly for the reason given by Franklin; it was so easy to become a land owner that few remained hired men voluntarily.

FAMILY LABOR

From the earliest settlements most of the work on Pennsylvania farms was done by the farmers themselves with the aid of their families and with the cooperation of their neighbors in certain operations. There was comparatively little hired labor except at harvest. The family-size farm prevailed.

Work is a habit with farmers, developed through many generations of industrious forebears. Colonial farmers had particularly heavy obligations in this respect. Often their days began at four A. M. and closed at nine P. M. There was no slack period in the year; in winter there was grain to thresh, fence rails to split, new ground to clear, firewood to cut. Indolence was not tolerated. In 1796 Thomas Cheyney of Thornbury, Chester County, indicated the exacting labor standard of his time: "I know many men that are worth thousand of pounds that will mow, make hay, reap and draw hay and grain into their barns as steady as hirelings; and those that are able, if they do not work, are looked upon with a kind of contempt. Here in the country they are slighted and are not company for anybody." [1]

The farmer's wife was his helpmeet; when necessary she worked in the field, especially at harvest. This was particularly true of Germans, somewhat less so of English and Scotch-Irish.

What constitutes "woman's work" on the farm has been subject to widely different interpretation in different countries and in different centuries. In the first English work on husbandry, written in 1552 by Sir Anthony Fitzherbert, he said, "It is the duty of the wife to winnow all manner of corn [all small grain], to make malt, to wash and to wring, to make hay, to shear corn, and in time of need to help her husband fill the muckwains or dung cart; to drive the plough, to load corn, hay and such other, and to go a ride to market; to sell butter, cheese, milk, eggs, chickens, capons, hens, pigs, geese and all manner of corn." After she had done this, cared for her children and fed and clothed her family, presumably she had the remaining time to herself.

"The Germans seldom hire men to work upon their farms," said Benjamin Rush in 1789. "Their wives and daughters frequently forsake for a while their dairy and spinning wheels and join their husbands and brothers." [2] Margaret Dwight, a New England woman who passed through Pennsylvania in 1810, was astonished and horrified when she saw women working in the fields. "Women in New England," she wrote in her diary, "are employed only in and about the house and in the proper business of the sex. I do not know that I was ever more struck with the strangeness of any sight than with the appearance and business of these German females." These "females," however, were doing only what their ancestors in Germany had done for generations. For the most part, their participation in what is generally known today as "man's work" was limited to grain and hay harvests and other emergency farm operations.

Our rural ancestors solved their labor problem by rearing large families. Few indeed were the colonial families of less than seven. Christian Good, a pioneer of Lancaster County, reared seventeen children, six sons and eleven daughters. Many other pioneer families were nearly as large. "In the year 1739," says Peter Kalm, "on May the 30th., the children, grandchildren and great-grandchildren of Mr. Richard Buttington in the parish of Chester in Pennsylvania were assembled in his house. They made together one hundred and fifteen persons." [3] Israel Acrelius testified in like manner: "The country is undeniably fruitful, as may be judged from the following example: Joseph Coburn, in Chester, twenty years ago had the blessing to have his wife have twins, his cow two calves and his ewe two lambs, all on one night in the month of March." [4]

This teeming fecundity was an asset, not a liability. Land was cheap, labor scarce and the cost of living low. The more children a farmer had, the greater his economic advantage. In early colonial days a tax of twelve shillings annually was laid on bachelors. "However inconsiderable this may be," said Schoepf, "it effects the desired purpose, because young men will not long expose themselves to mockery of this sort in a country where working hands can so easily find support for a family." [5] Benjamin Franklin remarked that a widow with several children was eagerly sought by fortune hunters.

In none of the ethnic groups that entered into the making of rural Pennsylvania was a large family more highly valued than by the Germans. In 1789 Benjamin Rush of Philadelphia, a man of English stock, paid this tribute to his German neighbors: "No dread of poverty nor distrust of Providence from an increasing family depresses the spirits of these industrious and frugal people. Upon the birth of a son, they exult in the gift of a plough-man or a waggoner; and upon the birth of a daughter they rejoice in the addition of another spinster or milk-maid to their family. Happy state of human society! What blessings can civilization confer that can atone for the extinction of the ancient and patriarchal pleasure of raising up a numerous and healthy family of children, to labour for their parents, for themselves and for their country." [6]

The primary reason why German farmers put their young sons and daughters to work on the farm and in the home instead of continuing them in school was fear that they would become lazy. To them, this was a cardinal sin. The ancient adage, *Muessiggang ist aller laster anfang* (Idleness is the root of all evil), was drilled into children from babyhood. "The Germans," said Rush, "take great pains to produce in their children not only habits of labour but a love of it. To fear God and to love work are the first lessons they teach their children." Very early in life farm boys and girls, not only those of German blood but also of other groups, were taught to exemplify the biblical injunction, "By the sweat of thy brow that shalt eat thy bread."

The labor of the farmer and his family was supplemented at times by the assistance of neighbors. Neighborhood cooperation was common in such operations as house and barn raising, log rolling, harvesting, corn husking and slaughtering. When a farmer had a task that was beyond the ability of himself and his family to accomplish, he called in his neighbors. Sometimes they "swapped work" with him; at other times the service was gratuitous and was made the occasion for festivity.

FREE LABOR

Free hired labor was a minor factor in colonial farming. When land could be secured so easily why should a man work on the farm of another? When almost any woman, even one of uncertain age and dubious pulchritude, could have a husband, why should she labor in the household of another woman? Wages were high, often higher than a prudent farmer could pay; but only skilled craftsmen could command wages high enough to offset the lure of cheap land. The kernel of the matter was discerned by Thomas Budd in 1685: "The chief reason why Wages of Servants of all sorts are much higher here than there arises from the great Fertility and Produce of the Place; besides, if these large Stipends were refused then they would quickly set up for themselves, for they can have Provisions very cheap, and Land is a small matter." [7]

Some of the first settlers tried to induce Indians to work for them but with signal lack of success. An Indian considered that he would be disgraced in the eyes of his people if he was seen engaged in manual labor. To him idleness, save for the chase and the warpath, was an exclusively masculine prerogative. "If any of these savages allows himself to be persuaded by a Christian to work," said Pastorius, "he does it with complaining, shame and fear as an unaccustomed act. He looks about him all the while on all sides lest any of his people may find him working, as if work was a disgrace." [8]

INDENTURED LABOR

Until long after the Revolution the main dependence of Pennsylvania farmers for labor was indentured servants. In 1764 the number in Chester County was 308. [9] Indentured servants were slaves only in a very restricted sense; the time of their servitude was limited and was fixed by legal agreement. Indentured labor was of two general types—voluntary, as redemptioners and apprentices; and involuntary, as debtors and felons.

A large number of the early settlers of Pennsylvania came as indentured servants, having been "bound out" to serve for a designated period. The majority were domestics but many were farm laborers. They were taxable and could be bought and sold like any other property, but could not be sold out of the province nor could man and wife be separated against their will. Their names and period of servitude were recorded by the courts. Some were "poor relations" of their masters. After their term of service had expired, most of them became substantial citizens. In 1722 Jonathan Dickinson declared, "Many who have come over under covenants are now masters of great estates." [10]

The position of an indentured laborer did not necessarily involve any degradation. The terms "bought" and "sold" as applied to them referred to nothing but the use of their time during a designated period. Usually they were considered temporary members of the farm family and treated as such. They usually ate at the same table and worked no harder than their masters. As soon as their time was up most of them secured land for themselves. Thus they served as a constantly shifting source of temporary farm labor. Demand for indentured farm labor was intensified by the general opposition to negro slavery, particularly among Quaker and German farmers.

Most indentured farm labor of colonial days became so voluntarily in order to pay a debt, commonly the cost of their passage from Europe. This form of servitude prevailed in Europe at that time and was firmly established in Virginia before the settlement of Pennsylvania, "as necessary from the circumstances of the country." The Duke of York's Laws, which were promulgated on the Delaware in 1676, provided, "No Christian shall be kept in Bondslavery, Villenage or Captivity Except Such who shall be Judged thereunto by Authority or Such as willingly have sould or shall sell themselves."[11]

Indentured labor was not cheap. The first cost might not be high but the upkeep was. The records of the Court at Upland (Chester) show that on March 12, 1678, Israel Helm bought "a Certagne man Servant named William Bromfield for y^e terme & space of four year's servitude," paying therefor "twelve hundred guilders," or about $150 present money. This was a moderate price; but in addition the farmer had to provide his bond-servant with board, lodging, clothes, care when sick and outfit him when his term had expired. Moreover, indentured labor was generally less efficient than free labor.

An Act of Assembly of 1683 provided that at the expiration of his term an indentured laborer was entitled to receive "One new Sute of Apparel, ten bushels of Wheat or fourteen bushels of Indian corn; one Axe, two howes, one broad and one narrow, and a discharge from their services." By Act of 1700 he was entitled to "Two compleat suits of apparel, whereof one shall be new; and shall also be furnished with one new axe, one grubbing hoe, and one weeding hoe." This continued to be the law until 1771. Farming had to be profitable to justify the use of indentured labor.

Indentured laborers were protected by law from abuse by and injustice from their masters. The records of the Court of Chester County for October 2, 1684 note, "Margaret Person Complained against her Master, John Colbert for his ill vsage and beating her Contrary to law. Ordered, that shee be disposed of for seven pounds."[12] Notwithstanding this means of redress, many indentured servants ran away; numerous advertisements of such appeared in newspapers. If captured, the law dealt harshly with them; they might be made to wear heavy iron collars with the names of their masters engraved upon them.[13]

A majority of indentured laborers were "redemptioners"—immigrants who had sold themselves into servitude in order to pay the cost of their passage from Europe. Germans predominated but there were a considerable number of English and Scotch-Irish. Traffic in redemptioners began about 1722 with the great influx of German immigrants and continued until after 1810.

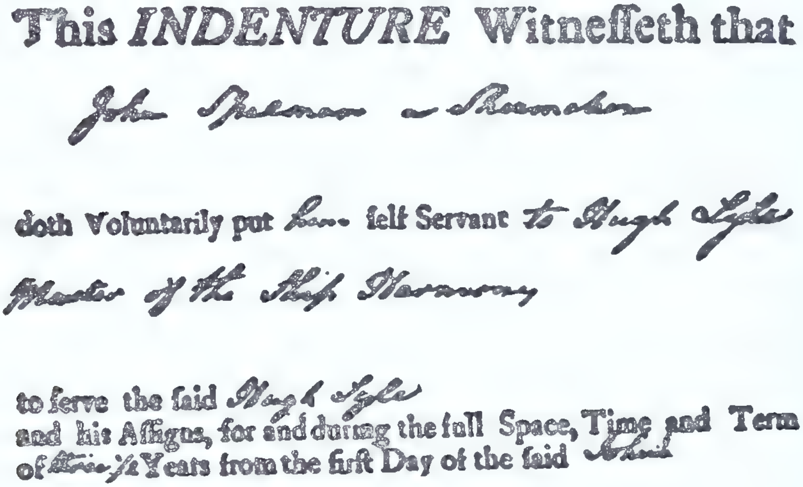
The cost of passage during the earliest years was £6 to £10 sterling. Later it was increased to £20. The ship's agent received one to two pounds for each immigrant over ten years old that he was able to entice to the ship and such sums as he was able to extort from the immigrants themselves. Those who did not have passage money agreed with the captain or his agent that they would be sold on their arrival for a term of years, usually three to five.

Parents sometimes found it necessary to sell their children to pay their own passage. "Many parents," says Gottlieb Mittelberger, "must sell and trade away their children like so many head of cattle; for if their children take the debt upon themselves, the parents can leave the ship free and unrestrained; but as the parents often do not know where and to what people their children are going, it often happens that such parents and children, after leaving the ship, do not see each other again for many years, perhaps no more in all their lives." [14]

Children under five years of age could not be sold. Older boys and girls were indentured for five to ten years or until they were twenty-one. Some were disposed of by the parents gratuitously to any person who would agree to raise them until they were twenty-one. Some immigrants who had enough money to pay their passage indentured themselves for a few years in order to learn conditions in the new country.

Traffic in human freight became "big business." Ship masters, mostly English, flooded western Europe with literature setting forth in most alluring terms the advantages of life in the new land. "Newlanders"—those who acted as procurers for ship masters—left their slimy trail through all the German states.

Conditions on ships that carried redemptioners often rivaled in horror those that prevailed on ships engaged in the African slave traffic. They



This *INDENTURE* Witneſſeth that

John Spelman a Shoemaker

doth Voluntarily put him ſelf Servant to Hugh Lyle

Master of the Ship Harmony

to ſerve the ſaid Hugh Lyle
and his Aſſigns, for and during the full Space, Time and Term
of [illegible] Years from the firſt Day of the ſaid [illegible]

An Indenture of a "redemptioner".

were over-crowded, filthy, the food poor and insufficient, and the water supply inadequate. Thousands died on the way. In 1738 alone it is estimated that from 1,600 to 2,000 redemptioners died on fifteen ships. Vigorous protests from the colonies were of little avail. Only after the Revolution was there any appreciable alleviation of the perils and discomforts of the redemptioner traffic. It is one of the blackest chapters in the founding of the Commonwealth.

The price paid by Pennsylvania farmers for redemptioners varied with their age, sex and vigor. In 1748 Peter Kalm reported, "They commonly pay fourteen pounds for a person who is to serve four years, and so on in proportion. Their wages, therefore, are not above three pounds Pennsylvania currency per annum." [16] The first public notice of the sale of redemptioners was in the *Philadelphia Mercury* in 1722: "Thomas Denham to his good country friends adviseth: That he has some likely servants to dispose of. One Hundred Palatines for five years at £10 a head."

As the number of redemptioners increased, there grew up an unenviable class of men called "soul-drivers." They bought a "drove" of immigrants at the port, wholesale, took them into the back country and there retailed them at great profit. Peter Williamson says the immigrants were "driven through the country like cattle to a market and exposed for sale in public fairs like so many brute beasts." A notice in the *Lancaster Intelligencer* for September 10, 1801 reads, "A number still on board the ship Anna, from Hamburg, lying abreast of Vine street wharf . . . consisting of Mechanics of about every description, Farmers and others; Their times will be disposed of at the low rate of $80 for their passage."

During the Revolution importation of redemptioners practically ceased. At the close of the war it began again, but the immigrants were mainly from Ireland and Scotland, not Germany. Indentured immigration continued in considerable volume until 1807; it practically ceased about 1820.

The redemptioner labor system had many vicious features. The immigrants often were subjected to extreme cruelty and privation on shipboard. Families were separated, often never to be reunited. It was, in effect, temporary slavery. On the other hand, it enabled many to escape from oppression in Europe who otherwise would not have been able to do so. It brought to Pennsylvania many thousands of sturdy, thrifty settlers who became substantial citizens. Many of the best farmers of the Commonwealth today are descendants of redemptioners.

FELONS AND DEBTORS

Pennsylvania adopted the English system of selling convicted criminals into servitude. Fortunately this colony was not made a dumping ground for malefactors from the mother country, as were some sister colonies. The Swedes harbored a few who were "to remain in slavery." The Duke of York's Laws recognized this class of labor but there was much opposition to it in the colony. In 1722 the Assembly passed an Act which would have excluded all immigrants who were felons or imposed a heavy duty on them, but it was vetoed by the Proprietary.

The jails of colonial Pennsylvania were few and flimsy; the colonists were not inclined to pay for building substantial jails or to pay the living expense of prisoners. Jail breaking was common. For these reasons sentencing criminals to a period of servitude was considered the most practicable means of punishing them. Sentence to servitude was mandatory for house-breaking and for setting fire to houses, woods, and hay or grain ricks, unless the offender could pay the damage.[17]

In 1726 the Chester County Court imposed servitude for eight years on a man who had stolen deerskins valued at forty shillings.[18] In 1737 Morris Camody of Lancaster County was convicted of stealing fourteen pounds seven shillings from Daniel Cookson. He was sentenced to be "whipped on his bare back with twenty-one lashes, well laid on," and in the absence of sufficient funds to pay back the amount stolen the sheriff was directed to sell him "to the highest bidder for any term not exceeding six years; and that the money thence arising be applied toward the payment of the fine and costs aforesaid." A Lancaster County farmer bought him for sixteen pounds.[19]

The most frequent cause of sentence to servitude was debt. In colonial Pennsylvania, as in England, debt was considered a crime punishable by imprisonment or by a period of servitude sufficient to satisfy the debt. Not uncommonly a man who had been imprisoned for debt advertised for some one to buy him out. An Act of Assembly in 1705 provided that at the request of their creditors the County Court was empowered to sell debtors who were not married and were under fifty-three years of age for a term of servitude not to exceed seven years; married debtors who were not over forty-six years old could be sold for five years' service.[20] This Act was repealed in 1729, revived in part in 1730, and repealed finally in 1800.

Sometimes children were sold to pay the debts of their fathers. "If he wishes to be released from prison," said Gottlieb Mittelberger in 1754, "and has children, such an one is frequently compelled to sell a child. If such a debtor owes only five pounds, he must serve for it a year or longer and so on in proportion to his debt; but if a child of 8, 10 or 12 years of age is given for it, said child must serve until he or she is 21 years old."[21] Directors of the Poor were empowered by law to sell men and women in the poorhouse for not to exceed three years in order to pay for their keep.

The harshness of debt laws was abated somewhat after the Revolution, but abolition of imprisonment and servitude for debt was not accomplished until July 12, 1842 when an Act of Assembly put an end to the barbarous practice. Debtor labor was a prolific source of trouble to farmers; the work was likely to be less efficient than that of free labor or apprentices.

APPRENTICES

Colonial Pennsylvania adopted, with slight modification, the Elizabethan statute of 1563 concerning apprenticeship. The terms of indenture frequently were less than the seven years prescribed for all apprentices in England. William Penn's *Frame of Government,* published in 1682, provided, "All children within this province of the age of twelve years shall be taught some useful trade or skill, to the end that none may be idle but the poor may work to live, and the rich, if they become poor, may not want." Apprenticeship was not merely a system of labor; it was a method of education, especially of the poor. Although abused at times it trained good workmen.

The articles of indenture were drawn with all the care of a conveyance of real estate. The master was required to provide food, clothing, shelter, care in sickness, and a certain amount of schooling, usually three or four terms; and to teach the apprentice what he knew about the skills of farming. The apprentice was obligated "his said master faithfully to serve, his secrets keep, his lawful commands everywhere readily obey." He could not leave the farm or marry without permission.

Orphans and children whose support was not otherwise provided for were apprenticed by the County Court. Thirty-three were so bound out at one session of the Court of Chester County. A parent could bind out his children or a guardian his ward. A boy was commonly apprenticed at twelve years to serve until he was twenty-one; a girl until she was eighteen. Boys were apprenticed to learn farming as well as to learn trades or crafts.

The relationship between the apprentice and his master usually was mutually helpful. He was considered a member of the family and so treated. He took an interest in the property and prosperity of his master. Few apprentices were abused. In 1770 a law was passed providing punishment for a master who ill-treated his apprentice, and severe penalties for apprentices who ran away or who did not render loyal service. At the termination of his apprenticeship the master often fitted him out with not only the two suits of clothes stipulated in the indenture but also with a yoke of oxen and other equipment necessary to begin farming. Nevertheless, apprenticeship carried with it some loss of social standing; "I'll bind you out" was a common threat of an irate father to an erring son.

The apprenticeship system continued until the rise of the factory system, about 1830; it was used longer in farming than in trades and crafts. It was a marked success as applied to farming. It not only provided efficient labor but also practical training for many youths who became good farmers.

NEGRO SLAVES

Negro slaves were comparatively few in Pennsylvania agriculture. The opposition to slavery of a majority of Quaker and German farmers limited the number that were owned and hastened the time of their emancipation.

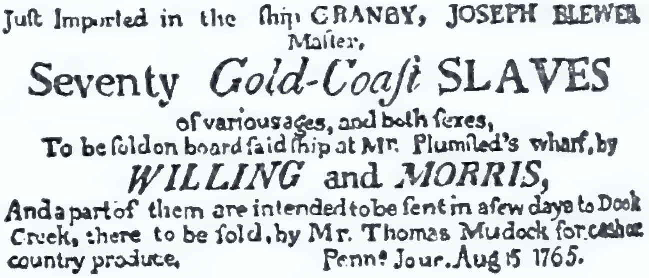
The coming of a shipload of negro slaves to Jamestown, Virginia, in 1619 marked the beginning of a labor system that profoundly influenced the economic and social life of the nation, particularly the South. Negro slavery was introduced into Pennsylvania in 1636 by Dutch settlers. In 1639 a white man who had wounded a soldier was sentenced to labor "along with the blacks." Before the arrival of William Penn the Dutch and English on the Delaware were actively engaged in the African and West Indian slave trade to meet the demand of the colony for labor. In 1662 Peter Cornelisz Plockhoy announced that no slavery would be allowed under his jurisdiction, but this edict had little effect.

William Penn was a slave owner. He interested himself in regulating "their Morals and Marriages" and their "trials and Punishments" in order that they should "receive proper treatment while in bondage." In 1685 he wrote to his steward at Pennsbury that it would be preferable to use blacks on his estate since they could be held for life.[22] But in 1700 he urged the Yearly Meeting of Friends to take a position against slavery. His will provided, "My will is that my negroes John and Jane his wife shall be set free one month after my decease"; and he bequeathed to "Old Sam" one hundred acres of land.

By 1702 negro slaves were reported as "numerous" in the province; and in 1721 it was estimated that the number was between 2,500 and 5,000. The maximum number was reached in 1751 when the estimate was 11,000, including those in the "lower counties," now Delaware. In 1780, when the state emancipation law was passed, the number had declined to 6,000. The first United States Census, in 1790, reported 3,737. By 1800 there were but 1,706, and in 1840 only forty.

The majority of negro slaves in Pennsylvania were domestic servants; probably less than ten per cent were farm help. More slaves were kept by Scotch-Irish, Welsh, Dutch and non-Quaker English than by Quakers and Germans. They were more numerous in proportion to the population in the southeastern counties than farther west. In 1845 Samuel Hart of Bucks County said, "From fifty to sixty years ago I could stand on a corner of my father's farm . . . and count sixteen farm houses, and in every house were slaves." In 1780 there were 580 slaves in Bucks County; in the area now known as Delaware County thirteen farmers had forty slaves.

Few German farmers owned slaves, not only as a matter of religious conviction but also because they preferred to do their work themselves; it was cheaper. A notable exception was James Kiemer, a German farmer of Lancaster County; he bequeathed eight slaves to his wife and children, with the stipulation that they be set free at specified times. The census of 1790 revealed that in Berks County, which was predominantly German, there were 464 whites to one slave; while in Cumberland County, which then was predominantly Scotch-Irish, the ratio was forty-four whites to one slave. The largest slave owning counties in 1790 were York, 499; Philadelphia, 387; Lancaster, 348; Franklin, 330; Fayette, 282; Bucks, 261; Chester, 145. "The Dutch element was the largest slave owners in Bucks County in 1780, when the first public registry of slaves was made . . . over one half of the whole number in Bucks County were held by descendents of Dutch families."[23]



Juſt Imported in the ſhip GRANBY, JOSEPH BLEWER
Maſter,
Seventy *Gold-Coaſt* SLAVES
of various ages, and both ſexes,
To be ſold on board ſaid ſhip at Mr. Plumſted's wharf, by
WILLING and *MORRIS*,
And a part of them are intended to be ſent in a few days to Dock Creek, there to be ſold, by Mr. Thomas Mudock for caſh or country produce.
Penn. Jour. Aug 15 1765.

Advertisement of a sale of Negro slaves in Philadelphia in 1765.

West of the Susquehanna slavery was practically non-existent among farmers. In 1829 Thomas B. McElwee of Bedford County wrote, "We have no slaves. . . . We are all free as the pure, unfettered mountain air we breathe and we intend to continue so."[24] According to Solan J. Buck, less than three per cent of the farmers in southwestern Pennsylvania owned slaves; and of these only seventeen had more than six, and most of them only one.[25]

Negro slaves were comparatively well treated in Pennsylvania, but they shared the common lot of slaves everywhere in the callous indifference of most whites. Negroes were put up for sale on Philadelphia auction blocks "like so many bullocks". Some were sent to jail regularly by their masters to receive a dozen lashes in order to "keep them submissive." A writer in *Pennsylvania Packet* quoted Genesis to prove that whites have divine sanction in their dominion over blacks, God having "formed them with horses, oxen, dogs, &c, for the benefit of the white people alone . . . to labour with their other beasts." Said Thomas Seabright, "I have seen negro slaves driven over the National Road arranged in couples and fastened to a long thick rope or cable, like horses. This was a common sight in the early history of the road and evoked no expression of surprise or censure."

In most farm families, however, negro slaves were treated kindly. In 1774 Crèvecoeur, writing from his farm at Carlisle said, "In Pennsylvania they enjoy as much liberty as their masters, are as well fed and as well clad, and in sickness are tenderly taken care of; for living under the same roof, they are in effect a part of the family. Being the companions of their labours and treated as such, they do not work more than ourselves, and think themselves happier than many of the lower class of whites." [26]

Slaves were not cheap labor. The first cost was high and the maintenance heavy. The price of human merchandise in early colonial days is revealed in the inventories of Dutch farmers of Bucks County in 1725: Negro Woman, £30; Negro children, £15, £10 and £5, according to ages. In 1760: "Negro man called Mink, £75; Negro lad called Futry, £30; Negro boy, £20."[27] A strong young negro field hand commanded from £20 to £50, often more. In 1748 Peter Kalm reported, "A full grown negro costs from forty pounds to a hundred pounds, Pennsylvania currency. . . . A negro boy or girl can hardly be gotten for less than eight or fourteen pounds." [28] Frequently slaves ran away and were not recovered. It was cheaper for farmers to do the work themselves if they could.

Many slave owners, especially Quakers, began to manumit or free their slaves soon after 1700; the number so set free increased year by year. Pennsylvania blazed the way for national emancipation.

The first group pronouncement in the colonies against negro slavery was made by German Quakers of Germantown, in 1688. They addressed this protest to the Friends Yearly Meeting: "Here is liberty of conscience, which is right and reasonable; here ought to be likewise liberty of body, except of evil-doers. . . . This makes an ill repute in Europe . . . that the Quakers do here handel men as they handel there the Cattle." The Yearly Meeting, however, hesitated; it found the matter "so weighty that we think it not expedient for us to meddle with it."

This indecision continued for more than half a century; the Yearly Meeting went no further than to advise Friends not to purchase any more slaves. Quakers were sharply divided on the issue, which was agitated at nearly every Monthly and Yearly Meeting. In 1693 a Meeting of those Quakers who followed the leadership of George Keith denounced the practice, stating, "To buy Souls and Bodies of Men for money . . . is a great hindrance to the spreading of the Gospel"; and urged that all negro slaves be freed "after some reasonable time of service."

Not until 1754 did the Yearly Meeting enjoin its members to "set their slaves free and make a Christian provision for them." Most Quakers complied, but not all. In 1758 the Yearly Meeting decreed that any member who bought or sold slaves could no longer take part in the Meeting. By 1774 practically all Quakers had freed their slaves. In 1776 the Yearly Meeting took the final step; it directed Monthly Meetings to exclude from membership all who did not free their slaves.

Quakers continued to wage vigorous warfare against slavery both in the General Assembly and in Congress until it was abolished nationally.

Meanwhile the civil authorities passed laws tending to discourage the use of slave labor. In 1705 the enslavement of Indians was prohibited; some Tuscarora Indians had been so treated. In 1712 William Southbe memorialized the Assembly to declare all negroes in Pennsylvania free. The Assembly resolved: "It is neither just or convenient to set them at liberty." In 1729 the Assembly levied a tax of £2 per head on all imported negro slaves. This was increased to £10 in 1761 and to £20 in 1773. The heavy tax served as a deterrent to the importation of slaves into the province. In 1761 "diverse merchants" of Philadelphia petitioned the General Assembly to remove this restrictive legislation, arguing that "an advantage may be gain'd by the Introduction of Slaves w^{ch} will likewise be a means of reducing the exhorbitant price of Labour and in all Probability bring our staple Commodities to their usual prices."[29] The petition was not granted.

The first abolition act in America was passed by the Pennsylvania General Assembly on March 1, 1780. It provided for "the gradual abolition of slavery." All adult slaves were to be liberated on or before July 4, 1827; children born before that date were to become free when they were twenty-one. This was followed by a law which provided that negro slaves coming into Pennsylvania were to be set free.

It must be admitted that the ultimate anti-slavery position of Pennsylvania did not wholly arise from ethical and humanitarian motives. Slavery was not economic here. The farms of Pennsylvania were small and a diversified husbandry was practiced; usually they could be operated to best advantage by the owners, with the aid of their families. The great plantations of the southern states, with their one-crop husbandry—tobacco, cotton or rice—were far more suitable for slave labor. The climate here was not favorable. Pennsylvania farmers had much better sources of supplemental labor, if any was needed, in indentured servants and apprentices.[30]

HARVEST SCENES OF LONG AGO

Before the introduction of labor-saving machinery harvesting grain and hay was a picturesque social occasion, not merely arduous work. Let those who were participants or eye-witnesses of the scene, in different counties, tell the story:

This description of wheat harvest comes from York County: "The harvest scene was a time of great enjoyment. Neighboring farmers assisted each other. Ten, fifteen and sometimes as many as a hundred reapers, both men and women, worked in one field as a gay, lively company. One 'through' was reaped, the 'grips' were bound on the return, and the keg of ardent spirits tapped at the end of each 'round.'

Before the introduction of the cradle tradesmen and townspeople all temporarily dropped their vocations and went to 'help harvest.' On the farm of George Hoke in West Manchester (York County) in 1828 there were 102 reapers, men and women, reaping with the sickle in one field. They soon cut the grain of that field and moved on to another. They passed along like a moving battle line. A good reaper could cut forty-two dozen sheaves in a day." [31]

From Fayette County comes this account: "It was a beautiful sight to look upon a gang of twenty or more reapers. . . . The best reaper was selected as a leader and the rest had to follow not far behind. At the end of a 'through,' which extended across the field, one half of the reapers took up all the sickles and carried them back half way to the starting point where, on the arrival of the other half, the sickles were taken up; thus the cut grain was bound into sheaves by the time the gang reached the beginning. The two reapers on each hand always put their grain in one grit to facilitate binding. Generally before another round was made cold water from an adjoining spring and whiskey from the green glass bottle were handed round and each partook freely to brace up the physical nature." [32]

From Bucks County comes this reminiscence of old-time haying: "There was a sentiment clinging around those old-time days of haying and harvest which the clatter of mowing machines and reaping machines has driven away. . . . The early start in the dewy grass; the falling into swath of lithe lines of clover and timothy over the reiterated swishes of curved blades in the zig-zag rows of stooped mowers; the "whetting the banter" by a peculiar clip of the rifle or whetstone, wherein a hidden challenge was given to the rest; the mortification of the luckless wight who was 'mowed around' at the risk of amputation of one or more legs; the luncheon brought out in mid-forenoon—a meal of pie, Dutch cheese and ginger cake washed down with a nectar composed of ginger, nutmeg and water. . . . No ten hour days were those, but turning the grindstone and bearing on the ringing scythe from dawn until breakfast; mowing until ten o'clock; shaking up hay and raking the windrows till noon; hauling in until supper time; and after supper mowing until set of sun." [33]

Competition quickened the tempo of the harvest scene. Women often were as skillful in the use of the sickle as men and strove in contest with them. "Victory was contended for in many a violent trial," says John F. Watson, "sometimes by two or three only and sometimes by the whole company. About the year 1741, twenty acres of wheat were cut and shocked in half a day in Solesbury, Bucks County." [34]

Men who worked hard in the field from sunrise till sunset ate and drank prodigiously. Not all the liquid refreshment was cold spring water; liberal supply of ardent spirits was a customary part of the wages of farm laborers. "Rum was drunk in proportion to the hurry of the business," said John F. Watson. "Nine o'clock pieces" were served in the field; usually they included a 'jigger of rum' for each man or woman. Whiskey was preferred to rum by most harvesters. Says a Centre County pioneer farmer, "It was the custom of the farmer for whom they worked to bring out the 'schnaps' which was pure rye whiskey. It usually was a large, round-bellied bottle of which all, both men and women, partook after eating. Then they worked until ten o'clock, when a fair lassie would come out into the field with a lunch of dried and smoked venison, wild pigeons, cake and rye bread." [35]

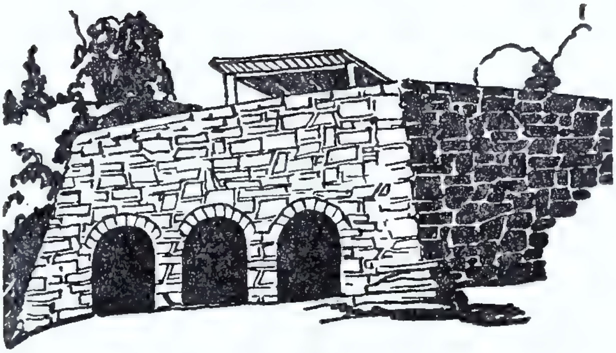
The bottle was replenished several times during the long, hot day. Rarely, however, was a drunken man seen in the harvest field; the tremendous physical exertion largely dispelled the stupifying effects of liquor.

George Logan, of "Stenton," near Philadelphia, was one of the first to operate a farm without the use of spirituous liquors. In 1787 he wrote, "During the first Years of conducting my Farm I gave my Men a dram in the morning & during Harvest allowed each Man one Pint of Rum P^{r} day. . . . Observing the ill consequences of this practice . . . I ventured this year upon an Experiment, and amidst the general Prejudices of the Country have conducted a Farm of about 200 acres under cultivation without the use of Spirituous Liquors of any kind. As a substitute I have given Small Malt Beer, made in the family. . . . This Experiment has been attended with a success beyond my most sanguine expectations. I have just finished a very extensive harvest without any accident, drunkenness or disorder and with an alacrity & neatness which I never before experienced." [36]

The precedent established by Logan gradually became the accepted practice, but it met much opposition at first. An historian of Centre County reports, "To Jonathan Spangler and Francis Gramly, Jr., must be ascribed the honor of having been the first farmers in the valley to abolish the custom of giving whiskey to harvest hands. This occurred in 1834. They were bitterly opposed in the course they attempted to pursue. Their hands were persuaded to leave them; other farmers endeavored to discourage them by asserting that no harvest could be cut without whiskey; yet their harvests were secured as on former occasions and people began to see that whiskey was not an essential factor in the problem of labor, and the custom died out." [37]

By 1840 the farm labor situation in Pennsylvania, always difficult, had become critical. The development of manufactures had begun to draw man-power away from farms while the development of labor-saving machinery had not yet proceeded far enough to offset this loss. Farm wages rose sharply. Boys and girls began to leave farms for cities; or, if they desired to farm, went West and homesteaded virgin land. Immigration gave little relief; most of the immigrants were Irish and English who preferred to work in cities or on public works, especially railroads. This emergency served to sharpen the wits of American inventors. Soon mechanical devices appeared which increased the productive capacity of the individual farmer. The era of mechanized agriculture was at hand.

VI



Lime kiln, Bucks County, 1820

SOIL FERTILITY

THE COMMANDING position of Pennsylvania in agriculture until after 1840 was due not only to the quality of her people but also to the quality of her soils. Many of them were high in native fertility. Yields of twenty-five to thirty bushels of wheat and sixty of shelled corn on virgin soil, without manure or fertilizer were not uncommon. "When the land was fresh and new," said John Watson of Bucks County, "it produced from fifteen to twenty-five or thirty bushels of wheat per acre."[1] In 1721, according to Robert Proud, "The settlements about the Indian village of Conestoga [Lancaster] were considerably advanced in improvements, the land thereabouts being exceedingly rich. . . . They raise great quantities of wheat, barley, flax and hemp without the help of any dung."[2]

Some river bottom lands were particularly productive. About 1760 John Bartram wrote about a tract on the Susquehanna River which was "so exceedingly rich for many miles square that it was like a rotten dung hill . . . weeds eight feet high . . . y^{e} soil black and rich 4 feet deep: I knowed one field that bore strong hemp for 12 years Successively after which it was sowed with wheat which for many years growed so rank that it could not stand but lay down before it ripened, producing very light grain; yet Indian corn & rye would prosper exceedingly."[3]

Like pioneer farmers of all ages and all lands, the first settlers took little thought of soil conservation. Apparently they looked upon the soil as a bank on which drafts could be drawn indefinitely without diminishing the capital. Not until declining yields made it necessary for them to do so did they give attention to this fundamental problem of agriculture. Even then, most farmers merely abandoned their impoverished old fields or "turned them out to rest" for a time as Indians had done before them, and cleared new ground. Colonial farming was soil exploiting, not soil-conserving.

"WORN-OUT" SOILS

Within a generation after the first farms were established along the Delaware there were signs that the soil fertility account in the land bank was getting low, if not already over-drawn. By 1730 many Bucks County farmers were complaining about poor yields. On most farms within forty miles of Philadelphia the wheat yield had declined from an average of 20 to 30 bushels an acre to ten bushels, and even less. In 1791 Richard Peters of Philadelphia reported to George Washington, "About 8 bushels of Wheat per acre is a full allowance for the better kind of farms in these parts. Some do not yield 6, and 8 out of 10 do not come up to 8 bushels per acre."

In 1791 it was stated that the average annual total production of a "good" 125 acre farm in Bucks County was 200 bushels of wheat, 300 bushels of corn, 100 bushels of oats, 75 bushels of potatoes and 25 tons of hay. This was unprofitable farming; the fields of Varro and Cato, Roman farmers before the Christian era, were more productive.

The draft upon soil fertility was particularly heavy because land was cropped almost continuously with grain. No consideration was given to the introduction of soil-building crops into the rotation. Old fields began to lose the capacity to absorb a large amount of water which they had possessed when first brought under the plow and when full of decayed and decaying vegetable matter. The soils became more compact. Eventually heavy surface run-off resulted in severe sheet and gully erosion.

There were two sovereign remedies for impoverished fields—to abandon them completely and clear new ground or to "rest" them for several years in fallow, which usually meant letting them grow up in weeds and sprouts. The new ground method was more popular. Land was abundant and cheap and most farmers owned more than they could use. It was more economical to abandon an old field and to clear a new one having virgin fertility than to attempt to maintain the fertility of old fields. The idea of the soil as an asset of the nation as well as of the individual, which should be preserved as a matter of public interest, had not yet entered the consciousness of American farmers. "No people," says T. N. Carver, "has ever shown itself willing to sacrifice its present interests in favor of generations in the distant future."

The economic justification for spendthrift agriculture was stated by George Washington, an eminent farmer of Virginia: "The aim of the farmers in this country, if they can be called farmers, is not to make the most they can from the land which is, or has been, cheap, but the most of the labour, which is dear; the consequence of which has been much ground has been scratched over and none cultivated or improved as it ought to have been; whereas a farmer in England, where land is dear and labour cheap, finds it to his interest to improve and cultivate highly, that he may reap large crops from a small quantity of ground." [4] Another prominent Virginia farmer, Thomas Jefferson, asserted, "We can buy an acre of new land cheaper than we can manure an old one."

The situation in the southeastern counties when the first English settlers were nearing the end of their earthly pilgrimage was set forth by Peter Kalm, in 1749; "Agriculture is in a very bad state hereabouts. . . . After being cultivated for several years in succession, without being manured, the land finally loses its fertility. Its possessor then leaves it fallow and proceeds to another part of his land, which he treats in the same manner. Thus he goes on till he has changed a great part of his possessions into grain fields. . . . He then returns to the first field, which now has pretty well recovered. This he tills again as long as it will afford him a good crop; but when its fertility is exhausted he leaves it fallow again and proceeds to the rest as before." [5] The fallow period might be from seven to fifteen years.

As pioneers advanced westward they followed the same system of soil robbery that had brought exhaustion to farms in the older settlements; they learned nothing from the experience of others. "Having abundance of woodland," says W. C. Carter of York County, "the practice was to clear a field every season. Wheat was uniformly the first crop, of which the yield was from 18 to 20 bushels per acre. The second crop was rye, then corn, then oats. After going through this course it was left for a year or two and then the course begins again; this was continued until the soil would produce nothing." [6]

The same short-sighted policy prevailed west of the Alleghenies. In 1832 a pioneer farmer of Butler County stated, "Many farmers prefer to sell their farms after having worked the land twenty or thirty years without fertilizing it, and therefore the soil has become impoverished and no longer yields rich harvests. Then they buy new land and clear it. Notwithstanding many farmers settled in this section thirty to forty years ago, still they never fertilize the soil. The only restoration the soil gets is that now and then the land is given a year's rest and the cattle are allowed to run over it." [7]

In this orgy of soil robbery there were a few exceptions, mainly among Pennsylvania Germans. Most of these frugal and industrious people cleared no more land than they could use to advantage. They were as wedded to all-grain farming as other farmers and were equally slow to introduce clover and grass into their rotation; but they did farm rather intensively and they saved and applied manure. Few of their fields were "turned out to rest," except for one or two years of fallow. Many of the first farms to be cleared in Lancaster and adjoining counties on limestone soil have produced good crops every year since they were carved out of the forest.

At the beginning of the Revolution the soil fertility situation on many of the older farms near Philadelphia was desperate. Some farms were abandoned. Thousands of acres of "old fields" on farms still under the plow were idle. It was the highly productive farms of Lancaster and adjacent counties that made Pennsylvania "the granary of the Revolution," not the farms of Bucks, Chester and Philadelphia counties.

CONTRIBUTIONS OF "GENTLEMEN FARMERS"

The first step toward improvement was taken, not by working farmers but by "gentlemen farmers," to use a now obsolete differentiation. These gentlemen—business men, merchants, statesmen, doctors, lawyers, judges, educators—had seen or read of the transformation in English agriculture wrought through the efforts of Townshend, Arthur Young and others. It was natural that initiative in this country should spring from two organizations in Philadelphia, which was the Amercan center of interest in the arts and sciences. These were the American Philosophical Society and the Philadelphia Society for Promoting Agriculture, both of which are still active.

At a meeting of the American Philosophical Society on March 5, 1773, it was recorded: "The Society, taking into consideration the great advantage that might be derived to the Public from Premiums granted to encourage the manuring of worn out Lands, which has been done with abundant Success in several parts of Europe by Marle & other composts," appointed a committee to investigate the matter and make recommendations to the Society. Dr. Francis Alison, a noted educator, was a member of this committee. The report of the committee at the meeting on April 2, 1773 was in the form of a paper by Dr. Alison entitled, "Hints for Improving the Present State of our Agriculture." [8]

Alison was one of the most progressive farmers of his time. He stated, "Our counties which were first cultivated are in many places quite worn out and the inhabitants are growing poor; and unless some remedy can be found, many parts of this province that be most convenient to our markets will have little products to sell." He suggested that the Society offer premiums for the most practicable method of restoring soil fertility, as by "the more efficient saving and use of animal dung, the most effective use of lime and marl" and by the use of other "natural manures," as creek mud, sea shells and salt hay.[9]

There is no record that the recommendations of Alison were adopted by the American Philosophical Society, possibly because the turbulent period of the Revolution intervened; but they bore fruit a few years later when the Philadelphia Society for Promoting Agriculture was organized. It gave immediate attention to the pressing problem of soil fertility. In the first year of its existence, 1785, it offered these premiums:

"For the best experiment made of a course of crops, either large or small, of not less than four acres, agreeable to the principles of the English mode of farming;—a piece of plate of the value of two hundred dollars."

"For the best method of recovering worn out fields to a more hearty state, within the power of common farmers, without dear or far-fetched manures; but by judicious culture, the application of materials common to the generality of farmers and founded in experience;—a gold medal."

"For the best field of clover on a farm, quality and quantity to be considered . . . and previous state and quality of soil; not less than ten acres;—a gold medal." [10]

These premiums stimulated discussion and experiment among gentlemen farmers. Eventually they resulted in a program of soil improvement that revolutionized Pennsylvania agriculture. This movement was further stimulated by high export prices for farm products between 1790 and 1810 resulting from wars raging in Europe.

The farm practice which transformed Pennsylvania agriculture most of all was the adoption of soil-conserving rotations. This was made possible by the free use of gypsum and lime. These, in turn, made it possible to grow red clover on upland fields, in rotation with grains, instead of only in irrigated meadows. Finally, the production of more clover and grass made it possible for farmers to keep more livestock and have more manure to apply to the land. Thus was forged the golden chain of a permanent agriculture, the links of which are crop rotations, lime, clover and grass, livestock and manure with supplemental fertilizer.

CROP ROTATIONS

Pennsylvania never has had one-crop farming; even in early colonial days, when all-grain farming was practically universal, several grains were grown in rotation. This was preferable to one-crop farming, but not much, for all grains are soil-depleting.

The paramount need of the settlers was grain; meat could be secured easily by killing game. Many farms had a small permanent meadow, often irrigated, but grass was not grown in a rotation. Practically all the farm was in grain, fallow and woodland. "Double cropping" was common—oats sown on corn stubble and on buckwheat ground, followed by wheat. This was continued until yields declined, when the land was fallowed. One of the advantages claimed for this rotation was that it "killed the noxious blue grass."

All-grain rotations continued to dominate the agriculture of southeastern Pennsylvania until about 1790. On the western frontier they persisted longer. In 1794 Cazenove found that the prevailing course of crops in Lebanon County on new ground was a six year rotation: 1 and 2, wheat; 3, oats; 4, fallow; 5, wheat; 6, fallow. On land that had been in cultivation a number of years a five year rotation was followed: 1, wheat; 2, barley; 3, corn or oats; 4, fallow or buckwheat; 5, buckwheat or fallow.[11] Even more soil-exhausting was the fourteen year rotation reported in Lehigh County in 1775: 1, 2, wheat; 3, corn; 4, 5, wheat; 6, 7, 8, barley; 9, 10, oats; 11, buckwheat; 12, 13, oats; 14, peas. Then the exhausted land was fallowed in weeds for seven or more years before being brought again under the plow.[12]

The "fallow" of colonial days was an Old World practice which had been used by Jews, Greeks, Romans and other ancient peoples long before the Christian era. No soil improving crop was grown while the land was "resting"; it was expected to renew its productive power by means of the spontaneous growth of weeds and bushes. Land was plentiful and cheap, hence fallowing had some economic justification in the absence of more constructive measures, but it was a wasteful practice.

The introduction into grain farming of soil conserving crops, especially red clover and grass, was advocated and practiced by a few farmers for nearly a century before it was generally adopted. The idea came to America from England where it had been urged by Townshend and other agricultural leaders.

The advantages of preceding wheat with one of the legumes, preferably red clover, was pointed out in the first American book on agriculture, by Jared Eliot, in 1748. In 1775 the anonymous author of "American Husbandry," who probably was an Englishman, recommended the following cropping system: 1, corn; 2, potatoes; 3, corn; 4, peas or beans; 5, barley; 6, clover; 7, wheat. He said, "In this system no two exhausting crops come together, peas and beans and in general the plants which bear a leguminous flower being of a different nature from corn in this respect."[13] Little heed was paid to this recommendation.

Pennsylvania is indebted to the gentlemen farmers of the Philadelphia Society for Promoting Agriculture for the solution of the problem of depleted soils. In response to the challenge of the Society "for the best experiment made of a course of crops" . . . two of its most influential members, John Beale Bordley and George Logan, submitted evidence. Both were familiar with the "Norfolk System" of crop husbandry which was beginning to transform English agriculture and had sought for a number of years to adapt it to American conditions. Judge Bordley has been called "the father of crop rotations in America." He was not the originator but was the most influential advocate of this practice.

In his *Sketches on Rotation of Crops,* published in 1792, Judge Bordley said, "The better courses of crops are founded on these principles: To fallow and to have growing on the fallow, while it is yet under the plow or hoe, a shading and ameliorating or mild crop, as peas or beans; never to sow any sort of corn [any grain] immediately after corn of any kind; to sow clover or an equivalent on every field of small grain; and to prevent the soil of the shaded fallows from resting, hardening and running into weeds." [14]

Judge Bordley had an inquiring mind. He conducted what was virtually an Agricultural Experiment Station on his 1600 acre farm on Wye Island, Chesapeake Bay. He condemned the three-field system of husbandry then prevalent in that section—corn, wheat or rye, fallow or pasture—and worked out an eight year rotation in which there were three years of clover. Turnips, which were an essential feature of the Norfolk system in England, as a cleansing crop, were eliminated as impracticable under American climatic and labor conditions.

George Logan also was an experimenter of rare discernment. In 1791 he published, "Results of a Course of Agricultural Experiments to Discover the Best Rotation of Crops." [15] This presented evidence from fourteen rotations on his farm, beginning in 1784. Like Bordley, he advocated an eight year rotation, "in which clover is absolutely necessary." Both Logan and Bordley stressed the value of applying manure liberally and regularly.

In making these recommendations, both men were not breaking new ground but they were instrumental in focusing attention on the problem. Seeding red clover with wheat had been practiced somewhat in New England and New York for many years. In 1679 Joseph Danckaerts reported that in New Netherlands (New York), "Some of them [grain fields] are now entirely covered with clover which diffuses sweet odor in the air for a great distance." Red clover had been grown sparingly in Pennsylvania from the earliest settlements, but not in rotations.

After 1790 crop rotations in which red clover and grass were alternated with corn and small grains quickly spread throughout the state. In 1794 Thomas Cooper reported that the usual course of crops in Lancaster County was: 1, corn; 2, wheat seeded to red clover; 3 and 4, clover; 5, corn. [16] Fortunately, gypsum and lime became more generally available about that time; this helped to introduce clover and grass into the then prevailing all-grain rotation. In 1804 Job Roberts stated that a Montgomery County farmer "had a rotation of corn or buckwheat, oats or flax or barley, wheat or rye, clover and grass two years. This enables him to keep a large stock of cattle and greatly contributes to the making of manure."

The rotation most commonly adopted in southeastern Pennsylvania about 1800 was for six years: 1, corn; 2, oats or barley; 3 and 4, wheat; 5 and 6, mixed clover and grass, mainly red clover, timothy and orchard grass. With slight modifications to meet special conditions and to accommodate special crops, as tobacco and potatoes, this six year rotation has remained the dominant course of crops of southeastern Pennsylvania. The farm was divided into six fields. Commonly the soil received a coat of manure every sixth year, before wheat; and a dressing of fifty to one hundred bushels of lime every sixth year, usually before corn, sometimes before grass.

By 1840 two general systems of crop husbandry were in vogue in the older farming districts. In *the cropping system,* the whole farm was in a rotation of corn, oats or barley, wheat, clover and grass. This system was followed almost universally by German farmers on limestone soil. A well watered part of the farm might be kept in permanent pasture and top-dressed with manure. In *the grazing system,* little land was plowed and only enough grain raised to carry the stock over the winter. This system was practiced by dairy and beef farmers near Philadelphia, especially in Chester County. Near the larger cities and towns, specialized farming for the commercial production of vegetables and fruit was beginning to develop.

RED CLOVER AND GRASS

The premier soil-improving crop of Pennsylvania—red clover—has been grown here almost from the first settlement. It was introduced into England from Flanders in 1633 and into America soon after. Before his death in 1740, Jethro Tull had demonstrated that clover increased the fertility of the soil far more than fallowing, which was practiced almost universally at that time. The experiments of Charles Townshend further emphasized the value of this crop. Among the "Provisions for Husbandry" of the first settlers of Maryland was "Good store of Claver Grasse seede to make good Meadows." [17] In 1685 Robert Turner, a Quaker farmer of Philadelphia, wrote to William Penn that he had "sowed great and small Clover, with a little old Grasse seede, for Tryall. . . . and it grows exceedingly." [18]

The Pennsylvania colonists secured most of their clover seed from the older settlements in New England and New York. In 1714 Jonathan Dickinson who had a farm near Philadelphia, wrote, "As to red clover, we can have enough from Rod Island, which takes well. White Clover comes Naturally without sowing." [19] In 1719 he bought 500 pounds of red clover from that colony. White clover quickly became naturalized in all the older settlements; in 1709 Dickinson said, "The white clover already tinges the woods as a natural production." [20]

At first, red clover was grown almost exclusively as a special crop, not in rotation, and mainly on drained or irrigated meadows. "Clover and timothy grass are the only species that are cultivated in our drained meadows," wrote Lewis Evans in 1754. [21] John Bartram had fields of red clover on his ditched farm by the Schuylkill. He was led to grow it by reading Jared Eliot's "Essays on Field Husbandry," which said, "I found by reading Mr. Hurtlib's Book of Husbandry [English] that it was principally by introducing this Clover Grass, called Flanders Grass because the seed was bro't from Brabant and other parts of Flanders, that the English had been able to improve their soils." [22] A Russian who visited John Bartram in 1769 quoted him as saying, "With the banks of my meadows ditches I have greatly enriched my upland fields; those which I intend to rest for a few years I constantly sow with red clover, which is the great ameliorator of our lands. . . . When I want to break up my clover fields I give them a good coat of mud which has been exposed to the severities of three or four winters. That is the reason that I commonly reap from twenty-eight to thirty-six bushels of wheat an acre." [23]

Red clover was not grown generally, however, until after the Revolution. Seed was scarce, expensive and often poor. "We are fast Getting into Clover," wrote William Logan in 1755, "but are at a loss for Seed that is good. What we have is chiefly red and comes from England." [24] Another hindrance to clover culture, not realized at that time, was soil acidity.

James Vaughn of Fatland Ford, Montgomery County, was one of the first to grow red clover extensively and to produce seed in quantity, beginning about 1785. He sought to enlist the aid of the Philadelphia Society for Promoting Agriculture in a memorial to the General Assembly petitioning for a bounty on red clover seed. "The high price of clover seed," he asserted, "discourages many from sowing it. The legislature ought to provide a bounty on clover seed and at the same time reduce the price to about five pence a pound. . . . I boldly assert this would prove of more real benefit to agriculture and stock than any other single thing. . . . Instead of bare fields, you will see them covered with grass and cattle." [25]

Clover seed production increased rapidly without the proposed bounty. A York newspaper for 1792 carried this advertisement: "Those farmers who would wish to improve their land and stock and put money in their purses by cultivating that valuable new article, CLOVER, may be supplied with seed by applying to the subscriber." [26] The price then was $20 a bushel, which is the equivalent in purchasing power to about $80 a bushel now. By 1820 red clover was grown throughout the area east of the Alleghenies and clover seed was an important article of export. In 1825 James Vaughn was able to report, "Ten thousand bushels of red clover seed have within a few months past been exported from Philadelphia to Europe, chiefly to England."

The marked expansion in red clover acreage after 1790 was made possible by the more general use of gypsum and lime. By 1815 "clover and plaister husbandry" had swept the state. Occasionally red clover was grown as a winter cover. In 1840 it was reported, "A first rate agriculturist and a member of the State Senate is accustomed to sow a full crop of red clover in his corn at the time of the last cleansing . . . He has obtained heavy crops without the least injury to the corn." [27]

Red clover was considered the greatest soil-building crop but grass sods were fully as important. John Beale Bordley expressed this succinctly in 1799: "Grass—the *sine qua non* of livestock, the essential of dung, the nursery of corn." [28] In early colonial days grass was not grown in a rotation but in permanent meadows which often were irrigated. "Let me desire thee to lay down as much as thou canst w^{th} English grass," wrote William Penn to his farm manager in 1686, ". . . & plough up new Indian fields & after a Crop or two they may be layd down so too; for y^t feeds sheep & y^t feeds y^e ground as well as they feed & clothe us." [29]

The more general use of land plaster and lime after 1790 led to the inclusion of grass as well as clover in rotations. In 1783 Johann Schoepf reported that the usual cropping system near Philadelphia was "to plant maize the first year; the second year wheat is sown along with English grass-seeds, and after the wheat is off the field is pastured for four or five years." [30] Soon, however, it was found more expedient to have permanent pastures and to include grass for hay in the grain rotation.

German farmers gave particular attention to grass as a soil conserving crop. In 1789 Benjamin Rush said, "From an attention to the cultivation of grass they often doubled the value of an old farm in a few years and grow rich on farms on which their predecessors had nearly starved." [31] By 1825 progressive farmers of all nationalities were in agreement with the statement of John Lorain: "The sooner grass seeds are sown the sooner the ground is filled with their roots, than which nothing (except yard or other rich manure) seems so effectively to counteract the exhausting effects of cultivated crops . . . Grass is Nature's infallible restorative." [32]

LIME AND LAND PLASTER

Of several factors that contributed to the transformation of Pennsylvania agriculture between 1790 and 1830, lime and land plaster were the most important. The use of lime as a "manure" began soon after the first farmers put the plow to their land. Lime, chalk and marl had been used as soil amendments in England for many years. In 1685 Budd wrote, "There is no Limestone [in Pennsylvania] as we yet know of; but we make Lime of Oyster shells which by the Bay side are so plentiful we may load Ships with them." In 1698 Gabriel Thomas recorded that although limestone was plentiful and cheap it was not used on the land "because of the natural fertility of the soil." [33]

Scattered deposits of limestone were found in the three original counties of Philadelphia, Bucks and Chester. In a deed from Lawrence Pearson to his brother Enoch in 1703, for a tract of land near Buckingham, Bucks County, he reserved "the privilege to get limestone from the within granted premises."[34] In 1754 Lewis Evans of Philadelphia reported, "Where the Veins of Limestone run through the Province they sometimes lime their Land; But they have not yet ascertained the Quantity best proportioned to an acre of land . . . One Man found by Experience that 30 Bushels an acre burnt up his Field so that it produced neither Corn nor Grass for 3 or 4 Years after. And 6 d. a Bushel is the usual Price at the Kiln."[35]

In 1754 William Logan of Philadelphia "put 50 Bushells of stone Lime in small Heaps to an Acre, which 10mo 1$^{st.}$ was obliged to slack with water hauled Put in Hogsheads, being a very Dry time."[36] The same observant farmer wrote to Jared Eliot in 1755, "I tried Lime alone ab't 60 Bushels an Acre & plowed in direct with the seed. . . . I can have it delivered on the Spot for ninepence Our Money per Bushel & will be a Cheap Manure if it Answers y^{e} Acc^{t} given of it; lasting 6 Crops."[37]

Among the first to use lime were German farmers of Lancaster County. In 1754 Governor Pownall visited "the beautiful Valley of the Pequea" and found "on every farm a lime kiln and the land adapted for the best of wheat."[38] In 1773 a pioneer farmer of Franklin County reported, "There is plenty of limestone for manure on every field and it does not cost much labor or expense to come at it and it can be burned with the wood which we grub up when we clear the land."[39] Johann Schoepf records in 1783, "Lime costs 8 d. to 13 d. per bushel, Pennsylvania currency; on ordinary upland they use 15-20 bu. per acre; on clayy low ground more than twice that much."[40]

The lime kilns of that period were often cooperative farm enterprises. Neighbors joined in hauling limestone and wood and tending the fire; the product was divided among them. At first, wood and limestone were hauled to the farm and burned there; the kilns were often a considerable distance from the quarry. Later, especially after coal replaced wood, lime often was burned in the open field, not in kilns. A huge pile of stone and coal, in alternate layers, with wood beneath, was capped with clay. This was known as stack burning. The commercial lime industry as we know it today did not develop until after 1840.

The use of anthracite coal in burning limestone, beginning about 1790, obviated long night vigils at the kiln. The Mt. Morris *Record* for November, 1789, informs us, "Mr. Lem Donley has built a very large lime kiln containing 3,000 bushels of lime stone, using 600 bushels of coal for burning it." "Lime frolics" became common. As recalled by Warren S. Ely of Bucks County: "From a dozen to twenty farmers joined in conveying lime from the kilns to a farm—enough for a field in a day, only to have the compliment returned later, either in lime hauling or other enterprises. . . . Many a jovial crowd of farmers have I seen drive up to the old lime kilns, unhitch their horses and feed them from the wagon bed, while the wagons were being loaded; and too often the free circulation of liquid refreshments increased the joviality to a dangerous point." [41] In some of the more remote districts of Pennsylvania wood was used for burning lime until after 1925.

Curiously enough, the introduction of gypsum, or land plaster, was required to awaken the majority of farmers to the need of liming. Richard Peters, President of the Philadelphia Society for Promoting Agriculture, was the discoverer and foremost advocate of land plaster in America. He gives this account of the discovery: "The first time I saw the agricultural effects of gypsum was several years before the commencement of our revolutionary war, on a city lot belonging to or occupied by Mr. Joseph Barge, on the Commons of Philadelphia. He was the first person who applied the gypsum in America to agricultural purposes, but on a small scale . . . He showed me a letter, in German, from one who had gone over from Pennsylvania to Germany for redemptioners; as was the custom of that day. The writer sent over a specimen of the gypsum. . . .

"The person who wrote from Germany to Mr. Barge informed him (with what correctness I know not) that the discovery was then of long standing in Germany; and that it had been accidentally made by a labourer employed in mixing stucco mortar at a large building. He saw that the path used, or made, by him in going from his work to his cottage threw up a luxuriant crop of clover in the succeeding season, when all other parts of the field exhibited sterility. He attributed this extraordinary vegetation to dust flying off his clothes and in consequence of the idea he strewed offals of the gypsum near his cottage. The effects astonished every spectator." [42]

Judge Peters procured a bushel of gypsum and began to experiment with it on red clover and other crops. The results on clover were so striking that he became an enthusiastic advocate of the use of "plaister." His associates in the Philadelphia Society for Promoting Agriculture quickly verified his results. Benjamin Franklin, whose keen interest in agriculture was evidenced in many productive ways, installed a demonstration on a farm in Chester County.

"Clover and plaister husbandry" quickly spread throughout the Commonwealth. In 1783 Johann Schoepf wrote, "About Philadelphia and Germantown, Whitemarsh, Lancaster and York, the use of plaister for grass and plow land has recently become a favorite practice, because there is less trouble involved than in collecting, lading and spreading of the common dung of cattle—trouble which the farmer here does not willingly submit to."[43] Land plaster was hailed everywhere as the quick and easy solution of the problem of depleted soils. A few scoffers dubbed it "conjuring powder" or "magic dust"; but a majority of farmers, having seen the almost miraculous results of applying it to clover, accepted it as "the perfect manure."

The most important outcome of the use of gypsum was the impetus that it gave to the culture of red clover and grass, and hence to the keeping of more livestock. Craig Biddle, reminiscing some years later, said, "Its special function was to promote the growth of clover, by which animals could be supported, manure made and the farmer thus enabled to produce any desired crop. Its introduction created as great an excitement as that of guano."[44] In 1797 Judge Peters published a pamphlet summarizing the results of numerous experiments with gypsum. "This pamphlet circulated widely and produced such a change of husbandry by introducing the culture of clover and other artificial grasses as gave, we all know, a magical increase to the value of farms. Estates which until then were unable to maintain stock for want of winter fodder and summer pasture were suddenly brought into culture and made productive."[45]

In 1801 William Strickland, an English traveller, gave credit for the introduction of land plaster into America to the German farmers of Lancaster County.[46] Judge Peters quickly corrected this error: "When I first sent samples of gypsum into that county very soon after I was acquainted with it I perceived the Germans there to be totally ignorant of its existence and of its agricultural use. More than ten or twelve years elapsed before they could be prevailed on to use it freely. . . . Some of our Germans of this day believe that gypsum invites thunder and lightning and on the approach of a storm turn out of their barns and houses the vessels containing this substance."[47]

At first gypsum was imported from Europe, later from Nova Scotia from whence it came as ship ballast. In 1816 gypsum coming from Nova Scotia to the port of Philadelphia amounted to 19,452 tons. In addition, many thousands of tons came from quarries on Cayuga Lake and other deposits in western New York discovered about 1805. "From Owego," says Jacob Cist, "it is brought down the Susquehannah, principally during the winter season, in arks and on rafts, the former generally about 75 feet long and carrying about 40 tons, and the latter from 10 to 12 tons. At Wilkesbarre, Berwick, Sunbury and other places on the river it is easily bought at 15 and 16 dollars per ton and has entirely superseded the use of imported plaster. During the summer of 1811 about 1000 tons were sent on as far as Harrisburg . . . During 1812 it is calculated that 6000 tons were sent into Pennsylvania."[48]

Gypsum was not expensive, since the usual application was only two or three bushels per acre, sometimes but one. Usually it was broadcasted by hand, mixed with soil, in early spring. Sometimes it was mixed with seed, especially small grains.

By 1810 there was considerable evidence that gypsum was not a "fertilizer" or "manure," as had been supposed, but was only a soil stimulant or amendment particularly beneficial on sandy and gravelly soils. After a time on all soils crops began to decline. In 1825 John Lorain cautioned, "The continued application of these substances [lime and gypsum] is so far from enriching the soil that it hastens the sterility of it, unless the evil be prevented by timely introduction of animal and vegetable matter." Eventually even Judge Peters admitted that land plaster was not a panacea. By 1825 it had been quite generally supplanted by lime, to which some farmers had clung tenaciously throughout the fervid land plaster era.

Gypsum was used extensively for only about thirty years but during this brief period it played a major part in transforming Pennsylvania agriculture. It was mainly responsible for bringing in more clover, more grass, more livestock and more manure. It broke down the prejudice of many farmers against the use of "artificial" fertilizers.

Even before 1825 lime had begun to displace gypsum in some parts of the state. "Lime is a great article in the Valley [Chester]," said Joshua Gilpin in 1809, "& there are numerous kilns of it: I find the price about 12 cents Winchester Bushel at the Kiln; it is all burnt with wood." [49] In 1835 lime cost twenty-five to thirty-five cents a bushel at the kiln. Fifteen cords of wood were required to burn 1000 bushels. The use of anthracite coal, beginning about 1815, simplified and cheapened the process. James Jamison of Bucks County was one of the first to burn lime with coal.[50]

By 1830 liming was firmly established as a standard farm practice; "lime and manure" was a farm slogan. In 1838 a Chester County farmer asserted, "The improvement which has been effected within the last twenty years in several of the eastern counties of Pennsylvania (and especially in Chester) is almost incredible. And the whole is mainly attributable to the regular and judicious use of lime." This was an overstatement; there were other factors, but lime and land plaster were the most important.

In 1838 a Montgomery County farmer summed up the situation admirably: "Some good farmers of the old school, and many bad and indifferent farmers, still resist the use of lime on their lands from a pretended apprehension that the ultimate effect of it will be injury to the soil; but the real reason is that it costs something. . . . One thing is certain, that those who have been spreading lime on their farms for the last eight or ten years have been subjected to vast expense in pulling down their old barns and building greater. . . . The number of cattle and the quantity of manure have been so increased by it that much expense has been incurred. . . . I throw out these matters for the benefit of timid farmers, so that they will not embark in the use of lime without being fully warned of the probable consequences." [51]

MANURE

With few exceptions, manure was not an important factor in the conservation of Pennsylvania soils until after 1800, when the use of land plaster and lime stimulated the production of more clover and grass and the keeping of more livestock. In early colonial days neglect of this primary means of soil fertility was appalling. Livestock ran at large and was housed only on the most severe winter days; there was little or no accumulation of manure. "The cattle here," said Peter Kalm in 1748, "are neither housed in winter nor tended in summer, and for this reason they cannot gather a sufficient quantity of dung."

Often manure that accumulated at barns was not used; it was considered a nuisance. Robert H. Rose of Susquehanna County relates, "There are three barns on the farm, one of which has been deserted by the former tenant, who found himself unable to get into it by consequence of the great quantity of dung about it, which had been accumulating since the commencement of the improvement." [52] In 1825 John Lorain added his testimony: "It is said . . . that the dung has accumulated around some barns in such great quantities as to render access to them so difficult that they have been burned and new ones built, as the farmer considered this more economical than encountering the labor of removing the manure." [53] The barns of that time, however, were crude structures of small value. In 1773 Alexander Thomson, who had just bought a farm in Franklin County, found "lying in several heaps at the house all the dung that had been made in the space of eleven years." [54]

Faced with the manure accumulation of years, farmers often invited neighbors to a "dung frolic." Many hands made light work of removing the objectionable material under the stimulus of good cheer, liquid and solid. Even if eventually applied to the land this manure was of poor quality, having leached in the barnyard for years. General indifference to the soil improving value of manure was due largely to the seemingly inexhaustible supply of fertile new ground.

There were, however, a few farmers who valued manure; most of these were Germans. As soon as they had built their spacious Swisser barns they began to save and apply manure. Corn stalks were thrown into the barnyard; what were not eaten were tramped by the cattle, mixed with manure and straw from the big stack. The barnyard was cleaned out once a year, after oats harvest, the compost spread on oats stubble and plowed under in preparation for wheat. A large straw stack and a barnyard full of manure, especially if the manure was enriched by fattening cattle, was considered evidence of good farming.

Both of the staunch advocates of soil-improving crop rotations—John Beale Bordley and George Logan—stressed also the importance of keeping livestock and applying manure. "The two principal links in good farming," said Judge Bordley, "are Rotation of Crops and Manures. . . . The farmer whose passion is for cultivating grain—and all grain—here sees how inferior his income is to the production of livestock. The maize, buckwheat, rye, barley etc. are consumed on the farm; and the wheat is looked to for procuring money. But see the difference between grain at market and livestock at market. . . . How superior the livestock for the soil and for the pocket!"[55] In 1789 George Logan urged that land be "given a full dressing of twenty large cartloads of good stable manure to the acre every seven or eight years and adopting a rotation of crops during that period."[56]

William West (1724-1808) of Delaware County was one of the most influential pioneers in livestock farming and manure conservation. "About 1765," says George W. Smith, "he commenced a system of farming that soon brought the exhausted land that he had purchased into a high state of productiveness. By the introduction of red clover he was enabled to increase his stock, which during the winter he carefully confined to the barnyard, which was kept well strewed with leaves from the woods and other vegetable matter. . . . His plan of farming was now changed and with plowing very little, an extensive system of topdressing was introduced by means of compost. He used lime, but to what extent is not known. He was, however, among the first to introduce gypsum. His farm was thus brought into the best possible condition for grazing."[57] William West was one of seven Americans made honorary members of the Board of Agriculture of England.

About 1825 the most prominent exponent of "soiling" cattle was I. W. Morris of Chester County. "I endeavor," he said, "to have my stock carefully and regularly fed five times in the day. They are stabled for this purpose at five, eight, eleven, three and six o'clock each day. They are in the stable nearly an hour each time. The remainder of the day they are kept in the barnyard. . . . The barnyard and stable should be cleaned daily and the manure hauled into an adjoining yard to a heap on which, being spread, it is immediately covered with a layer of loam to prevent exhalations."[58] Soiling or stable feeding as practiced by Morris never became popular since it involved much labor; pasturage was more practicable. The farms of West and Morris, however, were a strong influence for the conservation of soil fertility by the use of manure.

About 1810 the use of a "stercory" was advocated by Richard Peters and other leaders. This was a covered, water-tight pit in which manure was composted with muck, litter and weeds. At that time it was thought that manure should not be spread on land when fresh but only after being composted a year or more. Few farmers adopted composting because of the labor involved.

Some "plaister and clover" enthusiasts became convinced that these, alone, were sufficient to maintain soil fertility; that applications of manure were unnecessary. In 1792 Jonathan Roberts, a Chester County farmer, asserted, "There is no need of hauling Dung from Philadelphia, for I would not haul it as a gift, altho my team comes home empty many times a year. And it is my judgment there is no piece so poor But it will menure itself (with a little Lime and plaster), with good management." [59] This contention had been effectively answered several years before: "Some speculative men have ventured an opinion . . . respecting the possibility of ground being rendered forever productive without manure, merely by a rotation of crops. . . . Do not be misled by this vague assertion. . . . Do not neglect good stable yards to collect and preserve manure. . . . No rotation of crops can be pursued which will not exhaust the soil without the periodical application of manure, either immediately plowed into the ground or by pasturing of cattle." [60] This farmer had the weight of the argument on his side.

FERTILIZERS AND AMENDMENTS

Throughout colonial days commercial fertilizers were unknown. In 1686 William Penn, writing to his farm manager, summed up the fertilizer practice of his time: "Ashes & Soot are excellent for y^{e} ground, grass or corn. Soot may be gotten in Philadelphia for fetching, I suppose. It should be sowed pretty thick for Corn [all grain], in Spring not so thick; its best for Low lands & such as are moist." [61]

Pioneer farmers of Pennsylvania did not plant a fish in each hill of corn, as did the colonists of New England. Burning wood in clearing land covered the ground with ashes. Few farmers, however, applied ashes as a fertilizer; it was too valuable for making potash or pearl ash which were standard articles of trade with Europe. Spent soap ashes, the refuse after leaching ashes for making soap, were used occasionally; but since soap making was a home industry the supply was limited. In 1754 William Logan of Philadelphia wrote in his diary, "I laid on Wet soap Ashes about 40 to 50 Bushells to ye acre or more." In 1785 Charles Varlo enumerated the following "manures": marl, horse, cow and chicken dung, liquid manure, soot, wood ashes, ditch mud, salt, lime ("one of my favorite Manures as I have seen it work miracles"), and various composts.[62]

Crushed bone was first used as a fertilizer in England in 1775 but was little known here until after 1840. The first important source of commercial nitrogen was Peruvian guano. This was centuries-old deposits of the dried dung of sea fowls, discovered by von Humboldt in 1803. Some guano was imported into Pennsylvania about 1830 but not until after 1840 did it attain prominence as a fertilizer in this state.

The publication of Justus Liebig's *Chemistry in its Application to Agriculture and Physiology,* in 1841, awakened interest in agricultural chemistry and laid the foundation for the great commercial fertilizer industry of today. Not until after 1870, however, was the use of commercial fertilizers established on a sound basis; in 1853 the *Pennsylvania*

Farm Journal stated, "Agricultural Chemistry may be compared to a tree that is planted, has grown, and may have blossomed, but as yet has borne no fruit." [63]

Among soil amendments used occasionally on colonial farms marl and ditch mud were most important. Deposits of marl were not as common in Pennsylvania as in Virginia, where the experiments of Edmund Ruffin had demonstrated its value for sweetening acid soils. It was recorded in 1757 that James Matthers of Chester "had several acres of very poor Clay wch bore Cinkfoil on wch he putt 300 to 350 five-horse Loads of Mudd of the blue kind (marl). . . . His furthest distance for halling was ¼ of a Mile. . . . The Mudd covered ye Land 4 inches deep. . . . He performed part of this work about 15 years ago. The Grass has continued good ever since." [64]

Applications of ditch mud, peat, muck and leaf mold were made by a few farmers, notably John Bartram.[65] They were either spread on the land direct or composted with manure. Directions for composting were given by Bartram: "You should put a layer of mud half a foot or more thick, then such a quantity of common mould, then a layer of mud, *stratum super stratum,* until your bed is four feet thick. Let it lie and ferment a year; then cut it down to the bottom and toss it all together into another bed and let it remain half a year longer or more, then spread it on your ground." [66] The labor required in making such composts and in hauling ditch mud made these methods of soil improvement impracticable for most farmers; the use of soil-improving crops in the rotation and applications of manure were more feasible.

Marl deposits were much more common in New Jersey than in Pennsylvania. Farmers near the Jersey line sometimes hauled New Jersey "squankum," or green sand marl, fifteen to twenty-five miles and applied it to their fields as a top-dressing, one-half to one inch thick. This marl contained up to two per cent of phosphoric acid, much of which, however, was not in readily available form.

Little concern was expressed about the necessity for maintaining the organic content of the soil. Green manuring—plowing under crops for this specific purpose—was not practiced to any extent until after 1840. The scientific reason for the peculiar value of leguminous crops in soil improvement was suspected but not known. In 1811 Richard Peters said, "Leguminous crops . . . draw from the air their chief supplies. They probably give to the earth a balance beyond their receipts from it." [67] In 1825 John Lorain, who was far ahead of his time in appreciation of the necessity of keeping the soil in good physical condition, wrote, "The practice of ages determines that land is impoverished in proportion as the animal and vegetable matter contained in the soil is destroyed by severe cropping." [68]

The relation of tillage methods, especially deep plowing and frequent cultivation, to soil fertility was known to a few progressive farmers, among whom was John Bartram. Commenting on the repeated stirring of the soil advocated by Jethro Tull in his *Horse-Hoeing Husbandry,* Bartram said, "It is very likely they found benefit by it [in England] . . . in their northern Climate, surrounded with Marine moist vapours. Y^e attraction of y^e sun there is very moderate so as not to exhale y^e volatile fertilizing particles: But with us and to y^e southward our sun's heat attracts y^e terrestial exhalations forceably & y^e more y^e surface is comminated & exposed to y^e scorching rays y^e greater is y^e exhalation."[69] Bartram's idea was sound but his explanation faulty; loss of fertility from constant tillage was due not to "exhalations" from the soil but to destruction of organic matter.

Shallow plowing was the rule until about 1830. "The plough seldom turns the soil up from a depth of three inches," reported David Thomas in 1819 of farms between Erie and Pittsburgh. This was typical pioneer surface scratching—only deep enough to cover the seed. In older farming districts furrows were turned five to seven inches deep. A few farmers, as John Hare Powel of Philadelphia, practiced deep plowing and subsoiling.

The little land that was artificially drained was by means of open ditches and occasionally by stone, brush or pole drains. Tile drainage began in 1835 when John Johnson of Seneca County, New York, first demonstrated its superiority over more primitive methods; it was not used in Pennsylvania until after 1840.

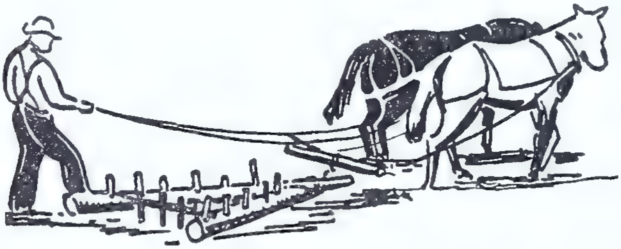
SOIL EROSION

The cumulative effects of cutting off forests and cropping the land continuously with grain began to be evident on older farms before 1750. Depletion of the organic content of the soil resulted in loss of water-holding capacity and eventually in eroded fields and mud-choked streams. "Our runs dry up apace," said Lewis Evans in 1753; "several which formerly would turn a fulling mill are now scarce sufficient for the Use of a Farm. The Reason of which is this, when the Country was covered with Woods and the Swamp with Brush, the Rain that fell was detained by These Interruptions and so had time to insinuate into the Earth and contribute to the Springs and Runs. But now the Country is clear'd, the Rain as fast as it falls is hurried into the Rivers and washes away the Earth and Soil of our Naked Fields, fills and choaks the springs, and makes shoals and sandbanks in our Creeks and Rivers; and hence several creeks mentioned by Mr. Penn to be navigable are now no longer so."[70]

Even in colonial days, however, when most of the province was still in woodland, there were disastrous floods. In 1721 a Philadelphia newspaper reported, "The rains of late have been very violent up in the country, especially to the westward of the Skullkill river, by which there came down such a sudden fresh, that in some places the water rose 20 feet perpendicular from its usual bounds in a few hours time. Many cattle were drowned, mills and bridges carried away and dams torn down." [71]

That the problem of soil erosion had become serious in the southeastern counties by 1791 is evidenced by the premium offered that year by the Philadelphia Society for Promoting Agriculture: "To find the best method of recovering old gullied fields to a hearty state; or, when damaged beyond remedy, how best to use them, as for tree planting." No award was made; the wave of enthusiasm over land plaster and clover submerged all other soil-conserving activities. Sod rotations that resulted from the use of lime and plaster contributed to better soil conservation.

The years from 1790 to 1840 were a period of agricultural awakening in Pennsylvania. Worn out fields were rejuvenated, farm mortgages paid. This was due not only to gypsum, lime, red clover and manure but also to better prices resulting from wars in Europe and the development of city markets. "The New Husbandry" and new markets brought to Pennsylvania farmers a period of prosperity that has not been surpassed. There was a growing appreciation of public as well as private obligation to conserve the fertility of the soil. This had been present among some German farmers for generations. Said G. Paul Musselman, "The Mennonite, with his sense of the power and will of God and of the necessity that all life here be made a witness of our belief in a life hereafter, thought of the soil as the property of God. . . . If you steal its fertility you steal from God."



Home-made log harrow with wooden teeth, 1720

VII

CROPS

ONE OF the major problems of the first settlers was to ascertain what crops were suitable to the unfamiliar climate and soil. They had brought seeds and plants of the most important food and fiber crops of the Old World. Then began a period of trial and error experimentation that extended for a century and a half. By 1800 the general pattern of crop husbandry had become fixed. So successful were these early tests that no new commercially important crop was introduced, except sorghum, before 1840. Wheat, corn, oats and grass were the most important crops. The only New World field crops grown extensively were corn and potatoes.

WHEAT

Contrary to conditions in other colonies wheat, not corn, was the premier crop. Wheat made Pennsylvania the richest colony of the North. There was an assured export demand for all surplus; this was not true of corn until after 1800. Wheat was the main cash crop. Not until after 1790, when soil-conserving rotations came into common use, did corn begin to rival wheat. On the western frontier, however, corn was grown more than wheat because it could be marketed to better advantage in liquid form.

After 1840 railroads began to bring to seaboard towns and cities wheat from Ohio and westward that could be sold more cheaply than wheat produced in the East. In 1800 Pennsylvania was the most important wheat-producing state in the Union. Forty years later Ohio had wrested from Pennsylvania supremacy in this respect; the four leading wheat-producing states in 1839 were Ohio, 19.5 per cent of the national crop; Pennsylvania, 15.6 per cent; New York, 14.5 per cent; Virginia, 11.9 per cent.

Wheat was grown on new ground almost continuously until the soil rebelled and other crops were substituted. Some new ground was too rich for wheat. "Nothing is more familiar to the farmers of Pennsylvania," said James Mease in 1808, "than the fact that land may be too rich for wheat. In the western counties of this state wheat sown upon such land will lodge before maturity; hence it is necessary to take more than one soil-exhausting crop of hemp or Indian corn to prepare the land for wheat." [1]

After the soil had become impoverished by continuous cropping in wheat and other grains it was fallowed for one to seven years. Fallowing from June to September only, in preparation for wheat, also was common. This was justified then as a means of ridding the land of weeds.

Seeding wheat or rye between rows of standing corn, in August or September, was a common practice in early colonial days. The first settlers chopped the seed in around the corn hills with a hoe. "In the month of September," said Acrelius in 1759, "when the maize has attained its greatest growth although not ripe, the strongest blades are cut off for fodder. They then plow between the rows of corn, sow wheat and harrow it in; and this, in the next year, gives a full crop." [2] This practice was facilitated by the wide space between corn rows then, commonly five or six feet.

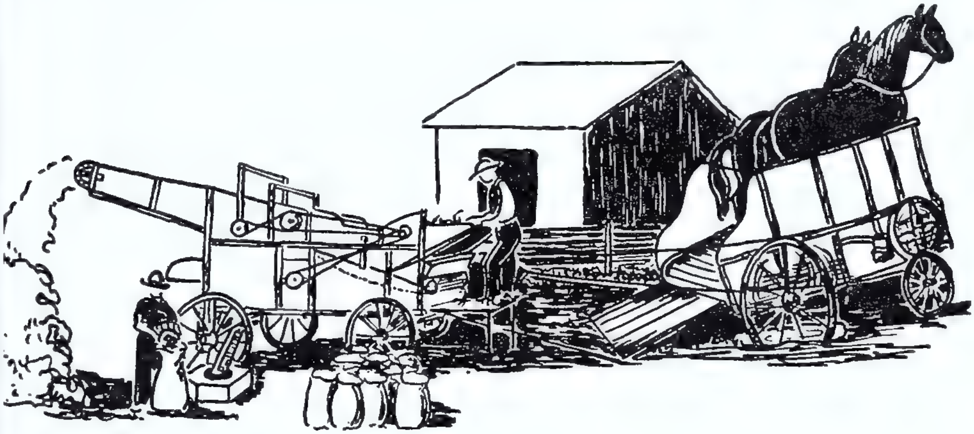
In the southeastern counties seeding wheat after corn soon became more popular than seeding it in standing corn. In 1686 Nicholas More wrote to William Penn, "The last year I did plant about twelve Acres of Indian Corn, and when it came off the Ground, I did only cause the Ground to be Harrowed and upon that I did sow both Wheat and Rye, at which many laughed, saying, That I could not expect any Corn [wheat] from what I had sowed, the Land wanting more Labour; yet I had this Year as good Wheat and Rye upon it as was to be found in any other place." [3]

Much of the wheat grown in early colonial days was spring or summer wheat. In 1682 William Penn reported, "They may sow eight Acres; half with Summer Wheat and half with Oates." [4] Said Thomas Paschall the following year, "Here is 3 sorts of Wheat, as Winter, Summer and Buck Wheat; the Winter Wheat they sow in the fall, the Summer Wheat in March, and these two sorts are ripe in June." [5] Surely he was in error as to the time of ripening of summer wheat; it must have been a month or more later. Winter wheat was more subject to insect and disease attack than spring wheat and sometimes froze out. On the other hand, spring wheat often headed prematurely because of heat or dryness and the "blast" (black stem rust). Ultimately winter wheat proved superior and spring seeding was discontinued.

Dependable varieties were not available until after 1840 when Mediterranean, a bearded red winter wheat, was introduced. Judge Frederick Watts of Carlisle and Andrew Beaumont of Solesbury, Bucks County, shared the honor of introducing this notable variety. It could be sown late in the fall yet matured early, thus escaping severe damage from Hessian Fly.

"About the middle of June, 1839," said Judge Watts, "near Trenton, New Jersey, I was met by a former resident of Carlisle Barracks, Lieut. Wm. Inman, of the United States Navy, who invited us to spend the night at his home on the farm. The next day he showed me a field of beautiful wheat which was ripening for the harvest. He told me that two years prior to that time he had procured three bushels of the seed near Leghorn, Italy, and was now raising the second crop. I obtained from him six barrels of the same kind and sowed it on my farm near Carlisle. That was the introduction into the United States of the beautiful variety of wheat which for a long time was very popular and was known as Mediterranean. From the six barrels which I sowed it was spread through the Cumberland Valley and into other parts of the state." [6]

The usual yield on new ground was fifteen to twenty bushels an acre but yields of thirty to forty bushels were reported. "It is common," said Caleb Pusey, the 'Governor's Miller,' "from one bushel sown to reap forty and fifty and sometimes sixty." [7] If the latter, it must have been from very thin seeding. By 1780 the soils of the three original counties had become so impoverished under the prevailing all-grain farming that yields had declined to less than half the former amount. "The average yield of wheat per acre in Pennsylvania," reported Richard Peters to George Washington in 1791, "is 10 bushels and about a peck." [8] A few years later it was six bushels. The culture of wheat in a soil-conserving rotation which included red clover, beginning about 1790, together with



Horse-power thresher invented by Moses Pennock, Chester County, 1827. It threshed 100-150 bushels of wheat a day.

the use of more manure, increased average yields to about fifteen bushels by 1822.[9]

As farming pushed westward high yields were secured from new ground. A correspondent of George Washington from York County in 1791 reported, "There are a few instances at York and Lancaster where between forty and fifty bushels of wheat have been raised to the acre."[10] In 1824 the Allegheny County Agricultural Society awarded a premium to Charles Johnson, who had produced fifty-two and a half bushels per acre on five and three-quarters acres.[11]

In colonial days wheat was subject to many ills. What was called "sick wheat" was peculiar to land in recent clearings, where the adjacent forest over-shadowed it part of the day. The shade, it was thought, caused a small amount of poisonous substance to adhere to the blossom end of each grain. Most of the "poison" came off in bolting. Bear grease spread on bread made from this flour was thought to be an antidote.

Many farmers believed that when wheat was grown under unfavorable conditions it turned into "chess," or "cheat," a worthless weed. German farmers washed their seed in a tub of water, carefully skimming off all that rose to the surface, believing that this would produce chess.[12] This fallacy persisted until about 1830 when better methods of farming banished forever fear of the transmutation of the gold of wheat into the dross of chess.

One of the most dreaded scourges of wheat was "blast," now known as black stem rust. This first appeared in New England about 1660; by 1700 it was common throughout southeastern Pennsylvania. Blast was attributed variously to "a vapour breaking out of the earth," to a "wind Northeast or Northwest at such times as it flowereth," to lightning, and to the phase of the moon when the wheat was sown.

The real cause of "blast" was discovered by farmers. They observed that wheat grown near wild barberry bushes was most subject to rust and insisted that there was some connection between the two. Scientists laughed at the suggestion. In 1726 the farmers of Connecticut secured the enactment of a law which granted to townships power to eradicate barberry bushes within their respective limits. Since no penalty was imposed for non-compliance this law accomplished nothing. Rhode Island was the first colony to pass an Act, in 1772, requiring that barberry bushes be eradicated and imposing a fine for non-compliance.

John Beale Bordley of Philadelphia was one of the first of the "learned men" to admit that farmers were right and scientists wrong. In 1797 he said, "Wheat has antipathy to the barberry bush because, for some distance around it, wheat is usually rusted, although the rest of the field be free from it." His explanation of the reason for this observed fact reflected the rudimentary knowledge of plant pathology of his day. Said he, "The barberry leaf and fruit are very acid. It is an acid effluvium from the bush that corrodes the wheat plant." [13] Full confirmation of the position taken by farmers did not come until about 1870, when several European scientists published experimental data which showed conclusively that the barberry acts as a host to the black stem rust fungus at a certain stage of its growth.

Hessian Fly devastated Pennsylvania wheat fields for many years. It was of concern to New York and New Jersey farmers before the Revolution, although the popular notion was that the insect was brought to America during the Revolution by the hated Hessians. At a meeting on May 18, 1768, the Committee on Husbandry of the American Philosophical Society considered "whether any method can be fallen upon for preventing the damage done to wheat by the Hessian Fly." [14] The result was a paper by "Dr. Bond" which was read at a meeting of the Society on June 21, 1768, but which illuminated the subject very feebly. [15]

Hessian Fly crossed the Delaware into Pennsylvania in 1786. As reported by Isaac Chapman in 1826, "The Hessian Fly first appeared in Bucks County in the spring of 1786, upon the banks of the Delaware opposite Trenton, having crossed the river from New Jersey where it had the preceding year destroyed the greater part of the wheat. . . . In 1787 the wheat was in several townships the greater part destroyed. . . . By 1797 they had spread west of the Allegheny Mountains . . . advancing about 30 miles in one summer." [16] So disastrous was the devastation that it seemed to some that wheat culture in Pennsylvania was doomed. On June 25, 1788, Great Britain promulgated an Order of Council forbidding the importation of wheat grown in any part of the United States. This was absurd, since the grain does not carry the insect.

But relief was in sight. On August 16, 1788, Henry Wynkoop of Bucks County reported "the success I have experienced this Summer of an Experiment made to evade the destructive Effects of the Insect commonly called the Hessian Flye. From the Sum-up of this experiment and many others of the same kind in my Neighborhood I am fully convinced that the yellow bearded wheat, notwithstanding this destructive insect, may be raised to great perfection upon good land. . . . It will be necessary that the Farmer be not only attentive to the improvement of his Soil, but that the Grain be sowed late in the Fall, or not until the Flye disappears." [17] The fly disappeared because it was killed by frost.

There was one great drawback to late seeding, however; the plants were more subject to black stem rust. Thus farmers were impaled on the horns of a dilemma. Many continued to seed wheat early. In 1824 a discouraged Bucks County farmer announced, "The failure of the wheat crop, attributed to Hessian Fly, through a great portion of our wheat country, brings us to the point where we ought at once to determine either to abandon the crop or devise some decisive measures for its future success. . . . Many farmers have not gathered the amount of seed sown." [18]

Farmers in central and western Pennsylvania were equally discouraged. Said the *Lycoming Gazette* for June 7, 1826: "The destruction by the Hessian Fly will be severely felt by the growers of wheat in this neighborhood. There are but few fields that will remunerate the farmer for his trouble of tilling and many from which, we are informed, there will not be a bushel of grain received. Indeed, so great has been the ravages of this destructive insect, that some of our farmers have determined upon ploughing down their wheat fields and appropriating them to other uses."

The introduction into Pennsylvania of Mediterranean wheat saved the day. As related by Andrew J. Beaumont, "About the year 1835 or 1836 I purchased thirty bushels of this wheat from Peter C. Schenck of Pennington, New Jersey. . . . He informed me that he had received three bushels of this wheat from a friend who was an officer of the United States Navy stationed in the Mediterranean Sea. . . . It was sown along side of my other wheat, and while the latter was entirely destroyed, the former was uninjured. Finding that it was really fly-proof, I advertised it as such in the *Pennsylvanian,* a paper published in Philadelphia, and I soon received orders from all parts of the country." [19] It was not "fly-proof," but late seeding favored fly control.

The visitations of Hessian Fly, though painful at the time, were not an unmitigated calamity. As Henry Wynkoop had suggested, it brought about better cultural methods, since it was found that crops on manured ground, well prepared, suffered less from the fly. By 1840 wheat was sown in late fall in soil-conserving rotations and the land was manured and limed at least once in six years. Under this improved culture average yields gradually increased to fifteen or more bushels an acre. In 1840 the two most important wheat-growing districts of the state were the limestone area in southeastern Pennsylvania, which had been in heavy production since its settlement, and the counties bordering Ohio.

CORN

Wheat took precedence over corn until after the Revolution not only because the climate and soil of Pennsylvania were exceptionably favorable for wheat but also because any surplus could be marketed to advantage abroad and in other colonies, which was not then true of corn. In 1775 a competent observer remarked, "Maize is not cultivated in such quantities in some parts of Pennsylvania as in more northern colonies. . . . Wheat thriving so well makes them neglect maize, which is a much less valuable grain. . . . This will be better understood when I add that Indian corn yields but 2s. 7d. a bushel when wheat is 7s. 6d. . . . They possess not a staple that will pay them for neglect of wheat." [20]

Even as late as 1790 there was prejudice against corn in some parts of the state. "Indian corn, though known to the early settlers, was not generally cultivated in Schuylkill Township or considered of value until after the year 1790. At that time William Moore raised a quantity of this grain and his neighbor, thinking it unfit for use, said in derision that he only intended it as cheap food for his slaves." [21]

Corn, however, was grown by most pioneer farmers for family use and as a dependable source of feed for livestock. Unlike wheat, it was not attacked by destructive insects and diseases. It could be grown on new ground with a minimum of preparation. It required less labor in harvesting and could be harvested over a longer period. In the absence of hay the stalks and blades could be used as winter fodder. It was indispensable in pioneer farming.

Corn being unknown in Europe, the first settlers adopted Indian varieties and cultural methods, including seed testing, planting in wide-spaced hills, interplanting with pumpkins, squash and beans, use of a husking pin, corn cribs larger at the top than the bottom and set on posts, and drying seed by hanging up ears by their husks, and such food uses as roasting ears, pone, hominy and mush. The Indians had two kinds of field corn, flint and dent, but others soon developed through seed selection. They also had pop corn and sweet corn.

Corn was an important crop of the early Swedes, who produced it mainly for home use. In 1654 Peter Lindström described their methods: "Maize, or Indian corn, grows of various colors—white, red, blue, brown, yellow and pied. It is planted in hillocks and squares, as the Swedes do hops. . . . Each stalk has six or seven ears. . . . In some parts they are as thick as the thickest man's arms, in other smaller. They have ten, twelve, nay fourteen rows of grains from the bottom to the top, which with God's blessing makes a thousand fold increase. . . . Out of the white and yellow maize they make bread, but the blue, brown, black and pied are brewed into beer." [22]

In order to economize labor and promote good drainage the Swedes often practiced "listing"—throwing two to four furrows together into a ridge and leaving the middles unplowed temporarily. This method was described by Acrelius: "Four furrows are plowed close to one another, and then five or six steps from these four other furrows; and so over the whole field. . . . For the planting is used a broad hoe wherewith the earth is opened to the depth of three or four inches, into which are cast five grains of corn. . . . Sometimes also they add two Turkish beans, which thrive very well with the maize and run up the stalks. . . . As soon as the young plant comes up it is plowed over and even harrowed, so that it may be free from weeds. When the plants are half an ell [about two feet] high the ground is hoed up around them; and again when they are two ells high. In the month of September when the maize has obtained its greatest growth, although not ripe, the strongest blades are cut off for fodder. . . . By the end of October the ears are ripe, pulled off on the field and carried home. The stalks and roots are torn up during the winter when the ground is loose to make the fields clean." [23]

When the English came they followed the Indian and Swedish method of planting in hills. In his advice to prospective settlers William Penn said, "Three Working hands, especially with a little help from the Woman and boy, may Plant and tend 20,000 Indian Corn Hills . . . there are 2717 hills to an acre. . . . The expected yield will be 400 bushels of Corn." [24]

Wide spacing of corn hills continued for more than a century. The cultural methods recommended by Charles Varlo in 1785 differed but slightly, save in the substitution of the plow for the hoe, from those used by the Indians: "When the ground is ready to receive the crop, make marks where the corn is to grow at six feet distance every way from each other, and at the center of every six feet make a circle a foot in diameter, in which set at an equal distance from each other four grains of corn. . . . When the corn is growing, plough between the rows as close to the roots as you can, in order to kill the weeds and freshen the plants by cutting superfluous fibres that run horizontally near the surface; this will make the tap roots strike deep in the ground. . . . A very good crop will produce sixty bushels an acre, but thirty is a fine crop." [25] Manassah Cutler recorded in his diary for 1788, "In some places [in Pennsylvania] I saw fields of corn the rows of which I judged to be a mile in length. The people do not hoe their corn at all, but plow it both ways."

Average yields about 1840 were twenty-five to thirty bushels of shelled corn per acre. Under special conditions, some very large yields on new ground were reported. In 1787 a farmer near Germantown produced "four hundred bushels of Indian Corn on four acres." [26] This must have been corn on the ear, not shelled. In October 1823 the Agricultural Society of Washington County awarded premiums to eight farmers of that county who had yields ranging from 120 to 136 bushels per acre, the Society "having before it authenticated Evidence of the Quantity raised per Acre, not less than five Acres." [27] A yield of 136 bushels (ears) per acre was reported from Susquehanna County in 1820. [28]

After 1800, cultivators supplanted plows for inter-tillage and distance between rows was gradually reduced; but planting in hills, equidistant each way, continued until the introduction of a satisfactory planter. Corn was topped and bladed for many years, leaving the ears to ripen on the stalk; this was thought to improve the grain and make the fodder easier to handle. Not until after 1800 was any considerable amount of corn cut close to the ground and shocked. The greatest advance in corn culture occurred after 1840, with the introduction of labor-saving machinery.

OTHER GRAINS

More rye was grown in early colonial days than barley or oats; in some districts it was a strong competitor of wheat. This was especially true during the period when the "blast" and Hessian Fly were ravaging wheat fields.

Rye was raised by almost every pioneer farmer, if only for straw to be used for thatching roofs, tying corn fodder, and making bee-hives and breadbaskets. Rye straw was valued so highly in Europe that the Swedes on the Delaware sometimes exported it. When wheat flour was high, thrifty farmers and their families ate rye bread and sold the more valuable wheat; the wheaten loaf was served only on Sundays and on special occasions.

Wheat and rye frequently were sown and harvested together; the mixed flour was known as "meslin." Another favorite bread flour in farm homes when wheat was too valuable for family use was rye and corn meal, called "rye and Injun." Parched rye was commonly used as a substitute for coffee although wheat was preferred by some for this purpose. In the western part of the state in particular, rye was valued chiefly for distilling into whiskey and was grown in preference to wheat for this reason before the coming of turnpikes and railroads.

Usually yields of rye were somewhat higher than those of wheat, especially on light or poor land or under indifferent culture. A fair crop could be produced even by a negligent farmer. In 1775 a shrewd observer stated, "They sow large quantities of rye on their sandy lands and on other fields when they are exhausted with wheat; rye is reckoned to pay them in some parts of the province as well as wheat." [29] Even on rich soil, rye often was preferred to wheat. "The early farmers of Lancaster County," says Franklin Ellis, "cultivated spelt, barley, oats and buckwheat for summer crops and rye for a winter crop. Wheat was not then raised extensively; it was considered of too delicate a growth and uncertain yield except in some few favored localities." [30]

In 1801 William Strickland reported, "All the back country of America is very favorable to the growth of rye; crops producing from twenty to thirty bushels are commonly met with; this grain is entirely consumed in the distillation of whiskey, chiefly for the consumption of the Irish frontiermen, except among the Germans, who use it for bread." [31] In 1838 there were 19,410 acres of rye in Berks County, as compared with 17,400 of wheat, 17,200 of corn and 15,700 of oats.

After 1840 rye production declined sharply. By that time wheat had become a dependable crop due to the introduction of the Mediterranean, which resulted in better control of Hessian Fly, because it fitted well into the soil-conserving rotations adopted about that time, and because of reduced demand for rye to make into whiskey. Then the wheaten loaf, perhaps mixed with a little rye, became the "daily bread" of the farmer and his family.

The large number of people of German descent in Pennsylvania gave impetus to the production of barley to make malt for brewing beer. When wheat was in light supply barley flour often was used for bread. Barley also was fed to livestock, especially horses. Chester County was noted for its heavy barley production.[32] "Spelt and barley held full sway in York County for nearly a century," says George R. Prowell, "when they gave way in the decade 1820-1830 to red wheat and blue stem wheat. The ears were smooth."[33] This was winter barley.

Two-row and so-called four-row varieties were grown. Their comparative merits were summarized by Gilbert Cope of Chester County: "The four-rowed variety was the most prolific, but the straw was so brittle that many heads were lost in handling. When bound in sheaves, the work was frequently done at night on account of the straw being less brittle then. . . . The two-row kind, though less prolific, was more easily handled and ripened a little later, after the wheat was out of the way. The principal use of this grain was for the making of malt. About 1822 the farmers, being under the impression that the Philadelphia brewers were combined to keep the price of barley at a low figure, organized the "Farmers' Brewing Company" and erected a brewery at Tenth and Filbert Streets, Philadelphia. . . . The venture was not successful."[34]

Average yields were 20-25 bushels per acre but yields of 50-65 bushels were reported. After 1840 barley became a minor crop; other grains, especially wheat, were more profitable.

In colonial days oats were commonly used as a nurse crop when laying down land to grass and were fed, unthreshed, to fattening cattle. Rarely were oats used for human food except by Scotch-Irish, who were desolate without oatmeal porridge. After 1800 draft horses gradually superseded oxen as motive power on farms and oats were in demand as horse provender. The practice of sowing mixed grains was much more common then than now; peas and oats, or rye and oats, were popular cattle feeds. After 1790 oats largely displaced barley in rotations. The average yield was 20-25 bushels per acre but yields of 50-60 bushels were not uncommon.

Buckwheat was grown in limited acreage from the earliest settlements. Thomas Paschall, writing in 1683, says that a crop of buckwheat often was taken off between the harvesting of winter wheat and the seeding of the next crop of winter grain. For many years buckwheat had the reputation of being the grain of poor farmers, since a tolerable crop could be produced even on poor soil and under slovenly culture. It was valued for poultry feed and for making cakes to be smothered in maple syrup. Buckwheat was used frequently to crowd out weeds. In 1799 John Beale Bordley recommended that this crop be used as a green manure and this practice became quite common on poor land. [35]

Spelt was popular for a time in German-speaking districts of southeastern Pennsylvania, particularly in Lancaster and York counties. Spelt or "German wheat" resembles wheat but the grain is covered with a thick husk or chaff which adheres tightly. About 1800, "all the grist mills in Lancaster County had special machinery adapted to the hulling of spelt before it was ground." [36] When more dependable varieties of wheat became available, soon after 1820, spelt passed out of cultivation in this state.

GRASS

"Labor is scarce," said John Beale Bordley in 1797, "hirelings are with difficulty managed even by the most experienced husbandman, and many peculiar attentions with much complicated work are appendant to a grain farm." He concluded, therefore, "The most advantageous use that I can put my land to is to keep it in grass." [37] Many other Pennsylvania farmers have reached the same conclusion.

The first settlers found native grass in abundance, both in the woods and in the marshes. Johann Printz, Governor of New Sweden from 1643 to 1653, told Peter Kalm, "In the early days there was grass in the woods which grew very thick and was everywhere two feet high." [38] According to Acrelius, "When the Christians first came to this country the grass was up to the flanks of animals and was good for pasture and hay-making; but as soon as the country has been settled the grass has died out from the roots so that scarcely anything but black earth is left in forests. Back in the country where the people have not yet settled the same grass is found, and it is called wild-rye."

The primeval forests on the banks of the lower Delaware and Schuylkill were quite free from underbrush; it was possible to ride through them on horseback almost everywhere and grass grew freely beneath the trees. Cattle fattened on this pasturage. In some places there were meadows where grass could be cut for hay; these were mostly burnt over areas or sites of Indian villages. Pioneer farmers in Lancaster, York, Franklin, Crawford and a few other counties found considerable areas of natural meadows or "deer parks." These were the result of the Indian practice of burning woods to attract game, especially deer and elk, to the rich grass pasturage that followed. Such areas were inappropriately called "Barrens." In 1838 the grass area in Berks County comprised 11,700 acres of red clover, 6,600 acres of timothy and 10,200 acres of "natural meadows." [39]

Few of the early colonists sowed "artificial grasses" for hay or pasture; they relied on the native supply. Livestock browsed in the woods most of the year; in severe winters they were kept alive on coarse marsh hay, mainly sedges, which was stacked near the marsh and hauled home during the winter as needed. This might be supplemented by corn stalks and straw. When a severe drought cut the supply of native grass great distress ensued.

The woodland pasturage was soon exhausted. It was mostly of coarse species, principally wild rye (*Elymus* sp.) and broom straw (*Andropogon* sp.). Grazing prevented these from re-seeding. Second-growth woodland had little grass, being choked with underbrush. Cattle might eke out a meager existence on tree and brush browse, particularly red maple, but this was a desperate expedient.

Prior to 1775 the forage situation in many parts of Pennsylvania was critical. "Travellers in New York, Pennsylvania and Maryland," said Peter Kalm in 1749, "find many difficulties, especially in winter, to travel with their horses, for the grass is not very abundant, the cattle having eaten it before it goes to seed." [40] A few of the more progressive farmers sowed "English grass." William Penn was one of these. In a letter to the steward of his estate at Pennsbury, written May 11, 1685, he said, "Hay dust from Long Island, such as I sowed in my court yard, is the best for our fields." Again, on September 7, 1685, he wrote, "Lay as much down as you can with hay dust." [41]

"Hay dust" was unwinnowed chaff from the bottom of mows and about stacks. It included the several perennial species then grown in England, such as timothy, orchard grass, bluegrass, perennial rye-grass, red and white clover. It also included many weeds. Even this mixture of grass and weed seeds gave better forage than native grasses. Systematic sowing of mixed grass seed was practiced by a few farmers before 1750. Winnowed seed of a single species was not available until after 1785 when Dutch fanning mills came into use. After 1790 grass, particularly red clover and timothy, was included in all soil-conserving rotations.

The first seedings of mixed English grass seed were mostly on unplowed land, mainly for pasture. Thomas Budd, writing in 1685, said, "If we sprinkle a little English Hay-Seed on the Land without Plowing and then feed Sheep on it, in a little time it will so increase that it will cover the Land with English Grass like unto our Pastures in England." [42] Speaking of conditions in Bucks County about 1720, John F. Watson said: "The plough was seldom used to prepare for meadows; red and white clover were only propagated by manure after they were first somehow scattered about in the new settlement." [43] White clover soon became naturalized and grew luxuriantly everywhere in the older settlements.

The first species of grass to be grown, as distinguished from nondescript mixtures, were red clover, white clover and timothy. Red clover was introduced into England from Flanders in 1633 and appeared in

America soon after. White clover was introduced into England from the same source and appeared in Pennsylvania soon after 1685. Timothy is a native of England but it was first used as a hay crop in America. About 1720 a New Hampshire farmer named Herd distributed it in the northern colonies under the name "Herd's grass." Another farmer, Timothy Hanson, distributed it in the central and southern colonies as "Timothy Hanson's grass." This was soon shortened to timothy.[44]

Two names for the same grass caused confusion. In 1747 Benjamin Franklin wrote to Jared Eliot, "You made some mistake when you intended to favor me with some of the new valuable grass seed (I think you called it herd-seed), for what you gave me is grown up and proves to be mere timothy; so I suppose you took it out of a wrong paper or parcel." Timothy became naturalized in new ground, especially in the western counties. A pioneer Jefferson County farmer says, "In those days [about 1835] people hardly ever sowed timothy seed. A little seed in the wheat got into the ground and taking hold in fence corners and around stumps, was ready to spread when a field was thrown out. Two tons of hay to the acre was thought nothing remarkable."[45]

Orchard grass, also native to England, was first grown in Pennsylvania about 1764 but did not become popular until 1820, during a temporary failure of the clover crop. Perennial rye grass, another English species, was first recommended for culture in Pennsylvania about 1755 by William Logan. Bluegrass, a European species, quickly became naturalized on new ground. It was particularly valued for pasture but was cut for hay occasionally, especially on limestone soils.

DRAINED AND IRRIGATED MEADOWS

Thousands of acres of swamp and marsh land along the Delaware and its tributaries were reclaimed by the use of dikes, flood-gates and ditches. The meadows of the Brandywine were particularly fertile. The early Swedes who initiated these drainage operations did not seed cultivated grasses on reclaimed land but mowed or pastured the native grass. Land that was dry enough was cropped with wheat, corn and tobacco but most of it was kept in meadow.

In 1759 Acrelius enumerated the advantages and disadvantages of diked-land farming: "Along the Delaware River and the streams which fall into it," he says, "there are large tracts of swamp which, within the last fifteen years, to the extent of many thousand acres have been improved into good meadows but at a very great expense. The mode of procedure is to enclose a certain amount of swamp with a bank thrown up quite high (five to ten feet) so as to keep out the water (the ebb and flood tides). . . . When dry, the earth is plowed, some kind of grain is sown on it, and then it is sown afterwards with clover and other English hayseeds. When people saw the success of such work their minds were so taken with it that in the year 1751 the price of an acre of swamp meadow advanced to six hundred dollars copper coin (about $60 present value). But some high tides came up from the sea and swept away the embankments. Thus the land returned again to its wild nature."[46] Another handicap, he states, was that reclaimed land was "constantly liable to inundation from tunneling of muskrats and crayfish."

The extent of the reclamation of swamp and marsh land for meadows is revealed in the farm assessment of Tinicum in 1784; this listed 1579 acres of drained marshes and 533 acres of upland. John Bartram, the eminent farmer-botanist, and his neighbors reclaimed several thousand acres of marsh land along the Schuylkill. Bartram was the moving spirit in organizing the first drainage district in America. By Act of Assembly, March 31, 1795, "The Company of the Southern District of Kingsessing Meadows" in Philadelphia County, was incorporated and charged with responsibility for "keeping the banks, dams, sluices and floodgates in repair."[47] As related by Bartram, "We yearly pay to the Treasuree of the Company a certain sum, which makes an aggregate superior to the casualties that generally happen, either by inundation or by musk squash . . . The expense is very considerable . . . but such is the goodness of the grass for fattening cattle that the produce of three years pays all advances."[48] Several similar drainage districts were established in Darby Township, Delaware County and elsewhere.[49]

Most reclaimed meadows were abandoned soon after 1810. The cost of keeping up dikes and ditches was heavy; high tides and floods breached the embankments; muskrats and crayfish tunnelled through them. With the introduction of land plaster and lime and the more general use of red clover it became evident that upland meadows were more practicable. The tides and rivers then reclaimed their own.

Irrigation was an important feature of Pennsylvania agriculture for many years, mainly on meadows of native grass. The Swedes practiced it extensively. In 1749 Peter Kalm reported, "The husbandman looks for all the springs in the neighborhood of a meadow and conducts the water to the higher part of the meadow. He then makes several narrow channels from the brook down into the plain so that it is entirely watered by it. To raise the water and spread it more, there are high dikes built near the springs. Sometimes the water is led around the sides of many hills for the space of an English mile and further, partly across valleys in wooden pipes. One that has not seen it himself cannot believe how great a quantity of grass there is in such meadows."[50]

In 1804 Robert Sutcliff reported, "In the neighborhood of Philadelphia it is the practice of many farmers to reserve about 15 or 20 acres for hay, which they continue to mow from one generation to another, many of them laying on little or no manure but taking advantage of a situation where the land may easily be irrigated . . . Two farmers informed me that upon an average they get about 2½ tons per acre upon this plan." [51] In 1775 the author of American Husbandry asserted, "By this management . . . they mow three crops a year, whereas without water they would mow but one."

Irrigation of meadows was practiced extensively in Lancaster, York and adjacent counties. When Governor Pownall visited Lancaster County in 1754 he was impressed with "the method of watering a whole range of pastures and meadows on a hillside by little troughs cut in the side of the hill, along which the water from springs is conducted, so that when the outlets of these troughs were stopped at the end, the water ran over the sides and watered all the ground between that and the trough next below it." [52] In Lancaster County farms were valued "in proportion to the quantity of land capable of irrigation"; and watered meadows were so highly regarded that "when the original tracts came to be divided, the rights thereto were carefully set forth in the title deeds, generally giving the use and control of the stream to the owners of the several tracts a certain number of days in each week alternately." [53]

Water rights were the cause of many disputes. "The right to take water from the lands of others," says Gilbert Cope of Chester County, "was often the subject of leases for ninety-nine years, or some other term of years. Sometimes the right to use the water was limited to certain days of each week. Disputes and litigation frequently arose. A farmer dividing his land between his sons was careful to give each a portion of irrigated meadow and hence resulted great irregularity in the shape of the farm. Sometimes the meadow was separated from the rest of the farm . . . As late as 1830 advertisements of farms in Chester County seldom failed to set forth the advantages of their meadows for irrigation." [54]

Both irrigation and drainage operations fell into comparative disfavor after 1800. More general use of gypsum and lime about that time made possible the production of red clover and cultivated grasses on upland fields at considerably less expense than on irrigated and drained lowlands. In 1799 John Beale Bordley summed up the situation: "In Pennsylvania, watered or irrigated meadows have long been in common use; and it is remarkable that the irrigated and bottom lands are now thought lightly of in comparison with the very high estimation they were in before clover came into field culture. So sure and plentiful are clover crops that Pennsylvania farmers are less solicitous about meadows. Till lately a farm without an irrigated or bottom meadow was never much valued. Now purchasers are less anxious for them, being sure of abounding in clover and hay from the arable upland." [55]

After 1800 the acreage in hay increased tremendously. Previously there had been very little commercial demand for hay; it was grown almost wholly for use on the farm. With the development of better roads, the number of horses increased rapidly, not only for use on farms, turnpikes and canals but also for city and town livery stables. By 1840 timothy and clover hay was one of the most profitable crops. In some districts, especially close to towns, the farm economy was built around the production of hay. In 1797 La Rochefoucault reported, "Common meadows [near Philadelphia] yield about three tuns, but those in good situation which are properly cultivated and sown with clover or other grass at times produce eight tuns. Hay is generally sold at sixteen or eighteen dollars a tun, but at this time it is thirty-three." [56] Eight ton yields may be questioned, but even with three ton yields hay husbandry was profitable at that price. Presumably these were irrigated meadows.

The transformation in Pennsylvania agriculture brought about by the more general culture of clover and grass on upland fields was observed by Joshua Gilpin in 1809. Speaking of York County he says, "In general, all the lands not plowed are covered with clover and other rich grasses, even on the hills—this is the effect of the late improvement in tillage which, by the use of plaster of Paris has converted the sides of the hills into as rich pasturage as the low grounds." [57] In 1830 John F. Watson added his tribute to the "New Husbandry": "It becomes a wonder to see men making grass and hauling it from upland fields. Everybody was delighted to see the effect of this new era in farming. . . . Before this time a farmer at Germantown would consider one hundred acres of land as inadequate to provide for his frugal living unless he had also a good portion of natural meadows to supply his stock. It soon came to be experienced that fifty acres of land, well tilled, produced enough to fill a barn of double the size before used." [58]

In some districts, especially near towns, timothy alone was grown for sale as horse roughage. This was profitable for the time being but was hard on the soil. In 1827 Lloyd Jones of Montgomery County sounded a note of warning: "Timothy is valuable for horses, but for the purposes of farmers I think it should not be raised. I have long since discontinued its growth. It is a great exhauster of the soil and should never be cultivated unless it can be carted to market and be replaced by large supplies of manure." [59]

PASTURES

There were few permanent pastures before 1750 except such as were provided by woodlands and old fields. Throughout the province white clover sprang up in abundance on new ground. According to Joseph Doddridge, in the Pittsburgh area "The native weeds were scarcely destroyed before the white clover and different kinds of grass made their appearance. These soon covered the ground, so as to afford pasture to cattle." [60]

With impoverishment of the soil by continuous grain farming, white clover and native grass largely disappeared. The prevailing practice in colonial days was to pasture livestock on worn out old fields that were growing up to weeds, briers, sour grass and possibly a little native grass. These "brush pastures" furnished meager sustenance. "On this," says John Beale Bordley, "their ill-fated horses, cows, oxen and sheep are promiscuously turned early in the season, before there is a bite; but they nibble off the scanty growth of rubbish as it rises. Here they continue until winter, sometimes through the winter; so that the ground becomes parched and trod to a dead closeness."[61]

The first permanent pastures were drained or irrigated bottom land. These "permanent meadows" usually were cut for hay but sometimes were pastured. A few farmers regularly laid down land in grass after taking off two to four crops of grain; these "upland meadows" were either mowed or pastured several years before reverting to grain. After red clover and timothy sod was introduced into the grain rotation, beginning about 1790, temporary pastures became more common. In 1791 a correspondent of George Washington from York County reported, "More than one half of the arable land is generally in grass for pasture, sown every third year with red clover or timothy seed."[62]

Permanent upland pastures first appeared in Chester and adjoining counties about 1790. William West of Delaware County was a leader in this field. He top-dressed his pastures heavily with manure compost and applied gypsum and lime frequently, thus bringing them to a high state of production. The pasture herbage was mostly bluegrass and white clover. About 1820 Chester and Delaware counties were the center of beef cattle grazing in America, largely because of the pioneer work of William West and Israel W. Morris. The development of commercial dairying near Philadelphia, beginning about 1830, still further emphasized the value of permanent pastures regularly manured, fertilized and limed.

"We have long sought a substitute for red clover," said John Hare Powel in 1827, "but notwithstanding the efforts which have been made for the introduction of Lucerne . . . this crop requires more labour and accuracy of tillage than most farmers in this state have either the means or the disposition to apply."[63] This is an accurate summary of experience with this legume prior to 1840. Alfalfa had been grown successfully in the Mediterranean region since the fourteenth century. The general failure of this crop in Pennsylvania was due mainly to soil acidity, lack of inoculation and low soil fertility.

Even good farmers failed with alfalfa. In 1738 Peter Collinson of London sent "some Burgundy Trefoil (*Medicago sativa* L, or Lucerne)" to James Logan.[64] In 1760 Jared Eliot discussed in his "Essays" the value of alfalfa and sanfoin; he stressed the necessity of applying lime freely. In 1775 the anonymous author of *American Husbandry* urged that alfalfa be grown for soiling (stable feeding), "keeping their horses, cows and other cattle under cover all summer . . . In this conduct they would, on a small quantity of land, be able to keep a large stock of cattle . . . and the quantity of dung would be of the highest importance in the management of their farms." [65]

Little heed was paid to these admonitions, even after the more general use of gypsum and lime had revolutionized the culture of red clover. "I have often endeavored to raise lucerne and sanfoin," said Richard Peters in 1828, "once on a large scale, but they require more than a common farmer can afford of time and labour." [66] Not until after 1910 did alfalfa become established as a standard farm crop in this state.

FIBER CROPS

Pennsylvania led other colonies in the production of fiber crops. They were grown as part of self-sufficing farming until about 1840, when the rise of commercial farming and the competition of cotton goods made them obsolete. Flax was grown more commonly than hemp and the culture of flax persisted longer.

Before the coming of the English, flax and hemp were grown for home use by the Swedes. In 1685 Thomas Budd, noting the "great quantities of exceedingly rich, open Land which is occasioned by the washing down of the Leaves and Soil in great Rains from the Mountains, near Minnisincks," urged that "a Law were made for the encouragement of the Linnen Manufacture by the Governours and General Assemblies, that all Persons inhabiting in Pennsylvania or New Jersey that keep a Plow do sow one Acre of Flax and two Acres of Hemp . . . Where in time may be conveniently settled a Manufacture for the making of Linnen Cloth, Cordage, Twine, Sacking, Fishing nets and all the other commodities commonly made of Hemp and Flax." [67]

Both crops require soil of high fertility, hence new ground was well adapted for their culture. Some over-rich new ground had to be cropped with flax or hemp for a few years before wheat could be produced on it without lodging. "Hemp and flax are among the most profitable productions of our rich midlands and new counties," wrote Tench Coxe in 1794, "the cream of which is yet to be skimmed." [68] When the fertility of new ground had been impaired by successive years of grain cropping, it no longer produced good crops of flax or hemp. To offset this decline several attempts were made to induce the General Assembly to grant a bounty, and legislative committees reported voluminously on methods of encouraging the cultivation of fiber crops.[69]

Nearly every settler had a "patch" of flax for home use. It was commonly estimated that one acre of flax was required to make summer clothes for a family of seven. Often there was a small surplus to sell.

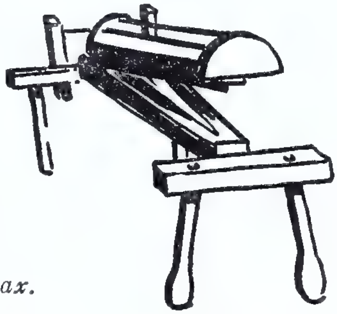
Under the leadership of Pastorius the Germans who founded Germantown in 1683, some of whom were expert weavers, established a small linen industry. Germantown was the center of the linen industry of America for many years. The coming of Scotch-Irish immigrants, beginning about 1728, further stimulated flax culture; they were skilled in the use of the flax spinning wheel.

Flax culture required much hard labor for both men and women. Many tedious hand operations were necessary before the raw fiber was transformed into linen. Seed was broadcasted in early May; the plants were ready to be pulled about the "heels of the harvest," in late July. They were pulled up by the roots and tied into small bundles four or five inches in diameter. These were laid out to dry for several days, being turned a number of times. This "pulling and spreading" was backbreaking work. Sometimes it was made the occasion for a neighborhood "frolic." When dry enough, the stalks were drawn through a coarse wooden or iron "ripple comb" to break off the seed-bolls, or these might be threshed off on the puncheon floor of the barn. This was slow and tedious work. Part of the seed was saved for planting; the remainder was sold to the oil mill.

After rippling, the stalks were again tied in bundles, wet and spread out on the grass to rot or "ret," to soften the fiber. This must be done "when the moon is pointing down," cautioned superstitious German farmers. When retted it was raked, tied in large bundles and then was ready to "break," or separate the fibers. Strong men were required to operate the ponderous break; usually flax was broken twice. All these operations had to be done in sunny weather.

When the broken flax was as dry as tinder, word was sent out to neighbors of an all-day "scutching frolic". Men, women and children came together in jolly company to scutch, or take out small particles of bark and separate the fibers. "They would shout and sing and wash the tow out of their throats with a little old rye whiskey; and when night had come and they had washed and put on their 'meeting clothes' they would take a few rounds of break-down on a puncheon floor." [70]

The next process was "hackling," or "hetcheling". The fibers were drawn slowly through a hackle—long steel teeth fixed in a board. This further separated the fibers according to length, firmness and quality; more than twenty manipulations were required. The first hetcheling gave oakum for caulking boats; the second gave tow for making rough clothing; the third gave fine linen for making clothing, towels, tablecloths, sheets. Then came spinning and weaving. Only necessity



Brake used to separate fibers of flax.

could justify the expenditure of so much labor as is involved in flax culture and manufacture.

After meeting home needs, any surplus was sold. Flax was one of the important commercial crops of Pennsylvania until manufactured cotton goods displaced homespun. The seed was crushed in local oil mills and the oil exported. Some seed was exported, mainly to Ireland. Testifying before the House of Commons in 1766, Benjamin Franklin reported that over 70,000 bushels of flaxseed were shipped from Philadelphia to Europe annually.[71]

After 1820 flax gradually gave way to cotton and wool as raw materials for the manufacture of clothing. Cotton triumphed over flax because its culture and manufacture were simpler and cheaper. Flax culture was relinquished reluctantly by many Pennsylvania farmers, especially those of German descent. In 1829 John F. Watson traveled from Reading to Lebanon. "All along my ride," he said, "I noticed everywhere fields strewed with flax laid out to dry—for everywhere German women still use the spinning wheel. Cheapness of manufactured goods will not allure them from their olden habits of making home-made stuffs." [72] In 1838 there were 700 acres of flax in Berks County.

"When I was a boy," recalled Grier Scheetz of Bucks County, speaking of the period about 1830-1840, "we had as much as 1000 bushels of flax-seed on hand at one time. The last flax-seed mill operated in the East was the one at Frenchtown, New Jersey, operated during the early seventies. The Deetz mill in Montgomery County, near Tylerport, was still in operation about 1840 . . . The Deetz team of eight horses drawing a heavy old-fashioned Conestoga wagon and carrying 150 bushels of seed at each load, was a familiar sight. It would make its trip through the country every ten days, hauling flax-seed which the storekeepers and other merchants had gathered in from the farmers." [73]

After 1840 flax ceased to be an important crop. It is still grown by a few farmers mainly for the sake of "old times".

Much was expected of hemp in colonial days but little was realized. It required deep, rich soil and quickly exhausted the land, much more so than flax. Such land was more valuable for producing wheat. Hemp was needed to make ropes for ship rigging, fishing nets and lines. In 1698 there were several "rope-walks" in Philadelphia.

After 1720 hemp culture began to fall off; it was cheaper to import it from Russia. In spite of this obvious economic disadvantage, no crop was more coddled by bounties. In 1715 the General Assembly passed "An Act for the More Effective Encouragement of the Raising of Hemp." This provided a bounty of one penny for every pound of merchantable hemp. In 1727 the bounty was reduced to a half penny.[74] Later the British government provided a bounty of £6 a long ton for hemp shipped to that country. Even this inducement was not sufficient to overcome the economic handicap; only sixteen tons were exported in 1740. In 1791 the Philadelphia Society for Promoting Agriculture offered a gold medal "For the greatest quantity of hemp raised within ten miles of Philadelphia." The premium was not claimed.

Most of the hemp produced after 1720 was grown in Lancaster and York counties. In 1747 Benjamin Franklin observed, "The greater part of our hemp is brought from Conestoga, a large and very rich tract of land on the banks of the Susquehanna. It is brought down in wagons."[75] Mills to prepare hemp fibers for spinning were common in those counties until about 1840.[76] Then Pennsylvania farmers gladly surrendered hemp culture to farmers in western states, mainly Ohio, Kentucky and Missouri.

POTATOES

The greatest contribution of the New World to the food supply of the nation, next to corn, was the potato. It is native to Peru where it has been cultivated from remote antiquity. There is no evidence that the potato was grown in the present area of the United States before European settlement. It was taken to Ireland from the West Indies before 1600 and soon became a staple food of the Irish. During the first twenty years of the Irish potato blight epidemic, more than a million people died of starvation. In the twenty years that followed, as many more Irish immigrated to America to escape this scourge and were instrumental in spreading potato culture here.

The potato was grown at Jamestown in 1629, probably from seed secured from the West Indies. In 1683 William Penn mentioned potatoes as a crop that the settlers might raise to advantage.[77] In 1685 Thomas Ash and in 1698 Gabriel Thomas did likewise. Possibly, however, all three referred to "Bermuda" or "red potatoes," which are sweet potatoes.

White potatoes were grown very sparingly, if at all, before 1720. Many people considered them poisonous; it was believed that if a man ate them every day for several days he would not live seven years more. They were thought to be poisonous to livestock, also. This prejudice against the potato, like that against the tomato, persisted many years. In 1819 William Cobbett said, "Nor do I say that it is filthy to eat potatoes. . . . What I laugh at . . . is the cultivation of them in lieu of wheat. . . . I now dismiss the Potatoe with the hope that I shall never again have to write the word or see the thing."

Others were more tolerant, although most farmers grew potatoes at first with many misgivings; not until after 1720 did they become at all popular. In 1725 a Delaware County farmer who has recently immigrated from Ireland wrote to friends in the Emerald Isle, "We also Planted a bushel of White Potatoes which Cost us 5 Shills & we had

10 to 12 bushels Increase."[78] By 1759 this crop had so far advanced in popular esteem that Acrelius devoted a paragraph to its culture: "Potatoes are planted thus: upon a smooth and hard ground a bed of dung is formed. Portions of this are thrown upon the potatoes, which are then covered with ground of even the poorest kind. When the stalks are come up about four ells high they are again hilled up with the same kind of earth in order to strengthen the roots, which are thus considerably increased in number."[79]

Varieties commonly grown at that time were not such as to induce enthusiasm for the crop. They were small, knotty, bright yellow "kidney" potatoes and few in a hill. About 1770 a large variety, the Bilboa, was introduced from New England. It had a sharp taste and pungent odor; in Pennsylvania it was known as the "Spanish" potato. This and other improved sorts began to find favor. In 1787 it was reported that on the farm of Mr. Stoneburner, a German farmer of Germantown, "One acre and a quarter produced four hundred and fifty bushels of potatoes."[80] In 1785 Charles Varlo enumerated several kinds, among which were Red Russetting, a round red sort with russet skin; White Russetting, a round, white-skinned russet variety; Irish White Smooth; and Early Wife, a small early sort. One of the most popular varieties during the first half of the nineteenth century was Mercer, which was originated by a Mercer County farmer. It was of varied skin color—red, white and even blue—but of good quality.

Charles Varlo was first in Pennsylvania to plant potatoes at the bottom of a plow furrow, thus dispensing with the former laborious method of planting each piece in a hole made with a spade. He also plowed out the crop at harvest. "Just before you intend to plant potatoes," he advised, "plow the land into two furrow-ridges, lying back to back . . . In every furrow set a row of potatoes, each about the length of a man's foot asunder; then take the dunging basket and drop a piece of dung about the size of your fist upon each potato. . . . When thus set and dunged go with the plow and split the ridge in two so that what was the furrow will now be the ridge, and the potatoes will come up in rows through the middle thereof."[81]

After 1790 potato culture advanced rapidly in spite of the prejudice of a few agricultural leaders, such as John Lorain of Philipsburg who declared in 1811, "Potatoes cannot be grown extensively except for cattle, and it has been asserted by many who are well informed that they will not pay for cultivating." They were one of the best crops for new ground. In 1838 over 4,000 acres were grown in Berks County.[82]

In 1819 Robert H. Rose of Susquehanna County described the crude methods of culture then prevailing on new ground: "Potatoes are very good here and considered a certain crop. . . . A very usual way of raising them here is this: after the timber has been burnt off, a slight hole is made with a stroke of a hoe in the ground, which has never been ploughed; into this a potato is dropped and the earth turned back upon it. In that way it is left to take its chance without further notice till it is time to gather the crop." [83]

Yields averaged about 100 bushels per acre but yields of 400 bushels and over were not uncommon. In 1791 a correspondent of George Washington from Lancaster County reported, "I have known less than one acre to produce upwards of four hundred bushels of potatoes." [84] In 1823 the Fayette County Agricultural Society awarded a premium to Charles M. Kinney "for the best crop of potatoes, being 528 bushels per acre." [85] According to the recollection of Frederick Huidekoper of Crawford County, "One hundred and twenty-five bushels were sometimes produced from a quarter of an acre, and in those days potatoes were rarely poor ones." [86]

The scourge of late blight swept over the state in 1840, having been introduced from Ireland where it had caused national famine. At that time little was known of the cause and control of fungous diseases, hence potato culture was hazardous until the advent of Bordeaux sprays, about 1887; these paved the way for the development of the great commercial potato industry of today.

TOBACCO

Much was expected by the early colonists from tobacco, but little was realized. It was one of the major objectives of the colony of New Sweden, but there is no record of shipments of tobacco to Sweden after 1647. The quality of tobacco produced along the Delaware was inferior to that of Maryland and Virginia and it did not bring a price that made it profitable as compared with wheat.

After the English came, a vigorous effort was made to encourage the culture of tobacco. In 1689 fourteen small vessels loaded with tobacco sailed for Europe from Philadelphia. Soon, however, the English, like the Swedes, found that wheat was more profitable. Connecticut Yankees who settled the Wyoming Valley about 1762 attempted to establish a tobacco industry there. "From the beginning," says Henry B. Plumb, "tobacco was one of the important crops. It was used by nearly every man and raised on nearly every farm. It was manufactured by the farmers at home into plugs and sold thus, as well as in leaf. Tobacco frequently was used to pay debts, there being little or no currency." [87]

Farmers in all parts of colonial Pennsylvania grew tobacco for home consumption but attempts to establish a commercial industry failed until about 1828, when several Lancaster County farmers began to grow leaf tobacco and roll it into cigars for their own use. Any surplus was disposed of at local stores for one cent each. These became known as "stogies," a contraction of Conestoga, a local river. In 1837 Benjamin Thomas of York experimented with some Havana tobacco, which did well. The next year he distributed seed among friends in York and Lancaster counties. This was the beginning of the "Pennsylvania seedleaf" tobacco industry, which now has grown to imposing proportions.[88] In 1840 the tobacco production of Pennsylvania was 225,018 pounds of which York County produced 162,748 pounds and Lancaster County 48,860 pounds. Soon thereafter Lancaster County became the unchallenged leader in tobacco production.

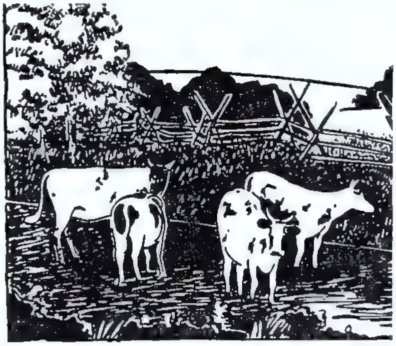
MINOR CROPS

Between 1780 and 1820, when the "Norfolk System of Husbandry" was being adapted to American conditions, the advantages of raising root crops—turnips, carrots, mangel-wurtzels, Swedes, rutabagas—to feed livestock were preached constantly by farm papers and agricultural societies. Turnips, in particular, were heralded as essential to good farming. This advice fell upon deaf ears save for a few wealthy patrons of agriculture, mainly because of high labor costs, especially at harvest and in preparing the roots for feeding. Root crops could not be grown to as much advantage in our hot and often dry summers as in the cool marine climate of England. In that country they could remain in the ground all winter and be pulled as needed; our winters were too severe for this.

Root crop culture had practically disappeared long before the silo came into use as a source of succulence for livestock in winter. A few large crops of roots were produced. In 1823 John Hare Powel of Philadelphia harvested 1,634 bushels of mangel-wurtzels on one acre and fourteen perches.[89] Turnips were grown more commonly than any other root crop; in 1838 there were 1,590 acres of turnips in Berks County.[90]

Peas and beans were common field crops in early colonial days. According to an old Swede who was consulted by Peter Kalm, "Every farmer had a small field of peas." By 1749, however, the weevil had become so destructive that pea culture was abandoned. Beans (climbing) were commonly grown for home use in corn fields but bush (navy) beans did not become an important field crop until after 1860.

VIII



LIVESTOCK

UNTIL about 1790 Pennsylvania agriculture centered around grain; livestock was incidental to this paramount interest. This was especially true of pioneer farmers. If protected from wild beasts, livestock could find a meager living in the forest without the necessity of clearing land. Abundance of game also acted as a deterrant to livestock farming. The founding of many farm homes was accomplished without livestock, save perhaps one or two cows, a yoke of oxen, a sow and a few chickens.

There were no native farm animals but the turkey; all others came from Europe. The Indians had no livestock but the dog, which they used somewhat in the chase but valued mainly as a source of food in time of famine. The voyage from Europe was long—several weeks or even several months—and the loss of animals on the trip was heavy. For many years loss from depredations of wild animals also was heavy.

Colonial Livestock

In colonial days the English word "cattle" included all four-footed farm animals. It was a derivation of the Norman word *catel* which, in turn, came from the Latin word *capitale*, meaning wealth; for the wealth of a Norman farmer was measured mainly in the number of cattle he possessed.

"The Swedes," says Peter Kalm, "brought their horses, cows and oxen, sheep, hogs, geese and ducks over with them. . . . The hogs propagated so much that, there being so great a plenty of food for them, they ran about wild in the woods, and the people were obliged to shoot them when they wanted them. . . . The horses ran wild in the woods in some places. . . . Food for all kinds of cattle was so plentiful and abundant that the cattle were extremely fat. A cow at that time gave more milk than three or four do at present [1749], but she got more and better food at that time than three or four get now." [1]

This rosy reminiscence of the old Swede he had interviewed is not fully substantiated by evidence from other sources. In the instructions to Governor Johan Printz, who headed the second Swedish colony in 1643, he was directed "to exert himself to obtain a good breed of cattle of all kinds, and especially of that which is sent out from this country, and also to obtain a supply from the neighboring English." [2] In 1645 the Swedes journeyed to New Amsterdam (New York) to barter for provisions and livestock. Four oxen were purchased for fifty-five beaver skins and one horse for thirty beaver skins. In 1647 Governor Printz reported to his principals that there were only twenty-five head of cattle in the colony and that most of these had been purchased from neighboring colonies. [3]

Thereafter the livestock of the Swedes increased rapidly. According to Amandus Johnson, "In the autumn of 1663 the Swedes, Finns and other nations had erected about 110 good boweries [farms] stocked with about 200 cows and oxen, 20 horses, 80 sheep and several thousand swine." [4]

The English under William Penn brought some livestock, but drew heavily on the stock of Swedes who had preceded them and of other colonies. In 1683 Penn reported to friends in England, "We have no want of Horses, and some are very good and shapely enough; two Ships have been freighted to Barbadoes with Horses and Pipe-Staves since my coming in. Here is also Plenty of Cow-Cattle and some Sheep; the People plough mostly with Oxen." [5] Penn must have been oversanguine about the "plenty of Cow-Cattle" for soon after his arrival it became necessary to pass this law: "If any person within this Province or territories thereof shall within three years kill or cause the same to to be killed, any Cow, Calf, or Ewe-lamb, whose dam shall not dye by casualty, Every such person shall forfeit five pounds." [6] This law was abrogated by William and Mary in 1693.

The nondescript livestock of the colonists eked out a miserable existence—ill housed and ill fed. If any barn was built it served only to protect the animals from wild beasts, not from the elements. Answering the question, "What becomes of your flock in the winter?" William Penn said in 1682, "Our Woods usually keep them for Market till December . . . they mostly shift for themselves. But if Fodder be wanted, we have a supply by Hay we mow in the Marshes and Woods, or the straw of the English grains we use, or the Tops and Stalks of Indian Corn. . . . Things hearty and easily raised." [7]

Answering the same inquiry Robert Webb replied, "We usually keep those in our woods up till the month of December which we desire to fatten for market or the butcher. . . . For the most part they find their own fodder the whole winter, except the young cattle or cattle that are with young, the which are kept near the house. But if one has need of fodder, one has the hay which one mows in the marshes and woods and the straw of the English grain, as also the tops and stalks of Indian corn, indeed sometimes the ears of the Indian corn itself." [8]

Neglect of livestock continued for more than a century except among German farmers. In 1749 Peter Kalm found conditions still deplorable: "Notwithstanding it was so cold (7 degrees below zero) and the snow lay near six inches high upon the ground, yet all the cattle were obliged to stay day and night in the fields during the whole winter. For neither the English nor the Swedes had any stables; but the Germans and Dutch had preserved the custom of their country and all generally kept their cattle in barns during the winter. . . . About noon the cattle went out into the woods where there were yet some leaves on the young oaks; but they did not eat the leaves and only bit off the extremities of the branches and the tops of the youngest oaks. The horses went into the corn fields and ate the dry leaves on the few stalks that remained. The sheep ran about the woods and the fields. The chickens perched on the trees of the gardens at night, for they had no henhouses. The hogs were likewise exposed to the roughness of the winter within a small enclosure." [9]

The general neglect of livestock by the early settlers was due, in part, to circumstances inherent in pioneer life; they were forced to provide food and shelter for themselves first. English colonists did not realize at first how much more severe the winter climate of southeastern Pennsylvania is than that of England; not until after 1750 did they begin to build substantial barns, similar to those that their German neighbors had been building almost from the first settlements.

The livestock of pioneers along the Delaware found most of their sustenance in the woods. "In the Woods," said Thomas Budd in 1685, "groweth plentifully a coarse sort of grass, which is so proving that it soon makes the Cattel and Horses fat in the Summer; but the Hay being coarse which is chiefly gotten on the fresh Marshes, the Cattel loseth their Flesh in the Winter and become very poor, except we give them Corn." [10]

The grass in the woods was mostly wild rye and broom straw; these grasses were all too soon destroyed by grazing them before they went to seed. They were not very nutritious as hay and it was difficult to secure a sufficient quantity for winter use. In 1749 Peter Kalm said, "Their cattle . . . have long ago extirpated all the annual grasses by cropping them too early in the spring, before they had time to form their flowers or shed their seeds." The culture of forage crops for winter feed was almost unknown then. Browse—the succulent young twigs of trees and bushes—formed a considerable part of the food of cattle and sheep throughout the year.

Practically all land except small fields that were fenced for tilled crops was open range and could be used by any farmer without trespass. "Considerable plantations," said the author of *American Husbandry* in 1775, "have no other fence than marks set upon the trees; so that cattle turned in the woods may wander into those of other men, and other cattle may make equal trespass. . . . Some men submit to the depredations of cattle rather than have the trouble of fencing." [11]

Ownership of animals on the woodland range was established by brands or ear-marks which were registered with county courts. In 1676 the Duke of York's Laws stipulated: "All Cattle and hoggs shall be markt with the publique mark of the Town to which they belong, and the private mark of the owner. . . . Whatever Swine or greater Cattle, Horses excepted, shall be found in the woods or Commons unmarked are Lyable to poundage." [12]

On July 11, 1681, William Penn required of all purchasers of land in the province: "That all shall mark their hogs, sheep and other cattle, and what are not marked within three months after it [the land] is in their possession, be it young or old, it shall be forfeited to the Governor, that so people may be compelled to avoid the occasions of much strife between planters." [13]

This condition was complied with quite generally. In the Record of the Court at Upland, "held at Kingesse County on Delaware River by His Majestees authority, June 14. 1681, Charles Jamsen brings in ye Eare Marke for his Cattle and Hoggs and desires that ye same maye be recorded. Granted and is as follows viz:—the foremost syde of ye Eare halfe cutt away." [14]

In 1682 the following law was enacted: "All sorts of Cattell whatsoever of six months old that shall not be Marked upon the ear, or otherwise marked with a Brand-mark; and which mark shall not be by the owners thereof brought to the clerk of the County Court or such other person as shall be appointed for that purpose and there be registered, shall be deemed and accompted Strays." [15] This law was continued in the "Great Law" of 1682. On May 10, 1690 it was amended to provide "No unmarked horses, mares, colts, hoggs or other cattle, shall be deemed and accompted strayes that are not eighteen months old." [16] This amendment was abrogated by William and Mary in 1693.

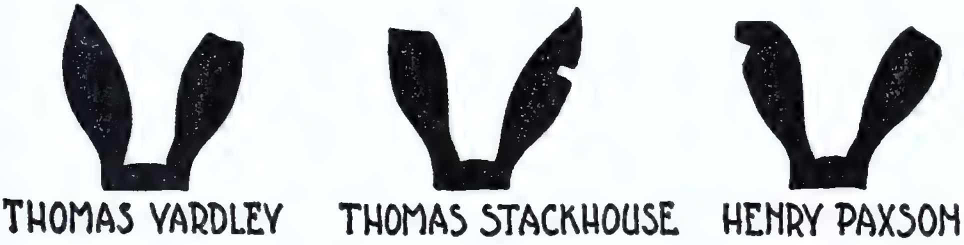
Livestock running at large near Philadelphia was ear-marked or otherwise branded until after 1700. The ear-marks were mostly cruel mutilations. Typical examples from the records of the court of Chester County are: "James Sanderlaine's ear marke, both ears Cropt and slit, his brand marke J. S." . . . ; "George fflorennan's ear marke, a Crop and Slit in ye farr ear, his brand marke G. F." [17]

Ear marks and brands were used on the western and northern frontier until after 1800. In 1774 the County Clerk of Lackawanna County recorded: "John Tryp ye 2nd. His Ear mark—a smooth Cross of ye Left Ear & a Half penne ye fore side of Each Ear." [18]

Eventually strays on the woodland range became so numerous and destructive to crops that in 1720 a law was passed "for erecting and maintaining pounds" in Philadelphia, Chester and Bucks counties. [19] This was followed by the Act of 1724 which provided for the appointment of Rangers to pick up stray livestock, especially horses. Pounds were established in several parts of the province. From 1784 to 1820 the cultivated Shawnee Flats in the Wyoming Valley were protected from depredations of livestock by a public pound. "In this stronghold," says Hedrick B. Wright, "were impounded all the cattle found running at large upon the Flats before the season of their being thrown open to the public. The owners could only procure their release on the payment of a fine. This averaged about twenty-five cents a head and was paid to the Key-Keeper. . . . You might see him every morning during the summer, at dawn of day, mounted on his gray horse, making a reconnoisance of the big field and if he made a large haul it was a pretty profitable day. . . ." [20]

Stealing livestock that ran at large was easy and common, in spite of severe punishment meted out to convicted offenders. In 1682 it was enacted: "If aine person shall at any time hereafter take, steal, kill, possess or convert to his own use any hogg or hoggs, shoat, pig, or other Cattle, belonging to any other person, hee or shee being Convicted thereof shall pay for the first offence to the owner treble the value thereof; and for the second offence hee shall pay treble the value thereof as aforesaid and also suffer six month's imprisonment at hard Labour; And for the third offence hee or shee shall pay treble ye value thereof to the owner and be whipt with thirty-nine Lashes on his or her bare back, well laid on, and be banished out of the Government." [21] This law was abrogated by William and Mary in 1693 but was re-enacted the same year.

Farmers commonly placed a triangular yoke about the neck of animals to help keep them within bounds. Bells were indispensible to reveal the whereabouts of stock that ranged far from home. They also helped



Ear marks of cattle as registered in Bucks County Court, 1682.

to protect the animals from wild beasts; rarely would a wolf, bear or panther attack livestock that carried bells. Bells were scarce and valuable on the frontier; to steal them was a major offence.

The inevitable result of poor food, poor shelter and promiscuous breeding of livestock running at large was degeneracy. By 1750 the stock was much smaller and less productive than the animals first imported from Europe. In 1748 Peter Kalm reached this conclusion: "The cattle degenerate by degrees here and become smaller. For the cows, horses, sheep and hogs are all larger in England though those that were brought over were of that breed." [22]

Even English livestock of that period, however, was much smaller than at present. According to Prothero the average size of animals sold in Smithfield market, London, in 1710 was: beeves, 370 lbs.; calves, 50 lbs.; sheep, 28 lbs.; lambs, 18 lbs. By 1795, when the culture of "artificial grasses" had become common in England, the average weights were: beeves, 800 lbs.; calves, 148 lbs.; sheep, 80 lbs.; lambs, 50 lbs. The livestock of Pennsylvania experienced a similar transformation about a quarter century later.

Meanwhile many Pennsylvania German farmers were putting into practice, and at a profit, their ancient adage, *Wer gut füttert, gut büttert* (He who feeds well, churns well). In 1789 Benjamin Rush described the methods of these good farmers: "They feed their horses and cows well, of which they keep only a small number, in such a manner that the former performs twice the labor of those horses, and the latter yield twice the quantity of milk of those cows that are less plentifully fed. . . . They keep their horses and cattle as warm as possible in winter, by which means they save a great deal of their hay and grain; for these animals when cold eat much more than when they are in a more comfortable situation." [23]

Indifference and cruelty in the treatment of the ailments of farm animals were appalling. "The common troubles of cattle," says W. J. McKnight, "were 'hollow-horn', 'wolf-in-the-tail' and 'loss of cud'. These were little else than the results of exposure and starvation. The remedy for hollow horn was to bore a gimlet hole in the horn near the head and then saturate a cloth with turpentine and wrap it around the horn. The cure for wolf-in-the-tail was to split the tail near the end with a knife and fill the cut with salt and pepper. The cure for loss of cud was to roll human excrement in dough and force it down the animal's throat. The same remedy was used for founder.

" 'Poll-evil' of horses was an abscess of the head behind the ears. If a horse did not please his master in his work he would be knocked down with a hand spike, a rail or the loaded butt of a blacksnake whip. . . . Poor food and these blows undoubtedly caused this horrible disease. Sick horses were not allowed to lie down, but were whipped, run and held upon their feet . . . Hogs were starved in winter and the result was considered a disease and called 'black teeth'. The remedy was to knock out the teeth with a hammer and a spike. . . . If the critter recovered, the remedy was the right one; if it died, the reason given was that the remedy was too late. A far better remedy would have been a bucket of warm slop, a tight stable and plenty of hay."[24]

The first attempt to improve this deplorable situation was made by the Philadelphia Society for Promoting Agriculture. In 1806 it offered a gold medal "For the best essay and plan for promoting veterinary knowledge and instruction," the essay to be "calculated to rouse the attention of medical professors to this important branch of neglected knowledge."[25] This bore fruit in an address by Dr. Benjamin Rush on November 2, 1807, on "The Duty and Advantages of Studying the Diseases of Farm Animals and the Remedies proper to Remove Them"; and ultimately in the establishment of the School of Veterinary Medicine of the University of Pennsylvania, the first such School in America.[26]

Between 1790 and 1840 the livestock husbandry of Pennsylvania was transformed. This was coincident with the development of the "New Husbandry"—the more general use of land plaster and lime and the inclusion of red clover and grass in the hitherto all-grain rotation. The greatly increased amounts of forage and grain thus ensured immediately resulted in a marked increase in the number and quality of livestock and in better care of farm animals. John Beale Bordley, George Logan, William West, Israel W. Morris and John Hare Powel were leaders in this development. By 1800 the average farm in southeastern Pennsylvania had approximately ninety acres in a grass-grain rotation, twenty-five acres in permanent pasture and thirty acres in woodland. This was in striking contrast to conditions less than half a century earlier when little pasture or meadow land existed.

Improvement in breeding occurred at about the same time. The initiative came mainly from England. About 1760 Benjamin Thompkins began to breed Herefords and the Duke of Bedford to breed Devons. Robert Bakewell, the first great English breeder, began his work about 1775. He developed Leicester sheep, which became popular in Pennsylvania. His major contribution, however, was a better knowledge of the principles of breeding. In 1785 the Colling brothers began to breed Shorthorns.

By 1800 the superiority of English breeds over the common stock on Pennsylvania farms was so obvious that a few progressive farmers, mostly wealthy patrons of agriculture, began to import them. Devon and Shorthorn cattle came first; Merino sheep, Berkshire swine, Jersey and Guernsey cattle soon followed. Not until after 1840, however, did Pennsylvania farmers generally give much attention to breeding.

The upsurge in livestock farming about 1790 was remarkable. In 1765 the number of cattle on 2,934 Chester County farms averaging

135 acres each was 3.7 and the number of sheep on 1,967 farms in the same county was 7.1.[27] Thirty years later the number of livestock on farms in southeastern Pennsylvania had more than doubled. In 1791 it was reported that the average Bucks County farm carried twelve head of cattle, twenty sheep, ten hogs and 120 chickens.[28] The displacement of grain farming by livestock farming, beginning about 1790, is one of the most important events in the history of Pennsylvania agriculture. It is especially significant in its relation to the maintenance of soil fertility and the development of a permanent agriculture.

CATTLE

The cattle of Dutch and Swedish settlers were mostly imported from Europe but some came from the older colonies. The Dutch brought cattle to New Amsterdam in 1624 and to New Jersey in 1625; some of the progeny of these animals were purchased by the Swedes on the Delaware who had brought only a few with them. Possibly some cattle came from Virginia, to which English cattle had been shipped in 1608. Virginia had secured cattle from the West Indies, descendants of Spanish cattle brought by Columbus on his second voyage in 1493.

According to William Penn there were "plenty of Cow-Cattle" on the Delaware in 1683. Some had been brought from England by Penn and his followers but most of them had been raised by earlier arrivals on the Delaware—the Dutch and Swedes. On October 6, 1683, the good ship Concord—"the Mayflower of the Germans"—arrived at Philadelphia, bearing not only Pastorius and his people but also "a score of cattle".

The cattle of early colonial days were small, scrawny and unproductive. This was due not only to insufficient and unbalanced feeding and promiscuous breeding but also to the character of the stock imported; only the smallest animals could be kept alive during the long voyage. Cattle were valued more for their meat and hides than for their scanty flow of milk. Oxen supplied most of the motive power on pioneer farms; when aged they were slaughtered for meat.

Most of the cattle of the first settlements ranged the forest, marshes and uncultivated clearings for a scanty fare of browse, weeds and native grass. The same situation existed in pioneer settlements of later years. "The cattle here [Susquehanna County] are greatly neglected," said Robert H. Rose in 1819; "the cows are seldom put under any shelter during the winter and it frequently occurs the first winter after a man has commenced his improvement that his cattle are fed principally with the branches of trees which are cut down for that purpose."[29] In severe winters browse might be supplemented with marsh hay and corn stalks. Frequently cattle died of starvation or by eating, in desperation, laurel, wild cherry and hemlock. Credulous farmers tied a dogwood bough about the neck of a cow that staggered from starvation—this was supposed to be a tonic! Cows lost in the woods might not be milked for several days, hence they dried up quickly.

In spite of the sanguine statement of William Penn that there were "Plenty of Cow-Cattle" the number did not increase as fast as was desirable. It became necessary to forbid or regulate their slaughter for meat and hides. In 1676 a law was passed, "Neither shall it be Lawful for any man to kill any Cow, Ox or Bull or such like Cattle, either for sale or for his private use, before he gives Notice thereof to the person appointed for that Town to register such matters." [30] Scarcity of cattle continued for many years. An Act of 1683 imposed a fine of £5 for killing a cow or calf during the ensuing three years, one half of the fine to go to the informer. In 1701 the Provincial Council resolved, "That no person shall kill or sell to kill above one half of theer growing neat Cattle."

Common herding of cattle was not practiced as much in Pennsylvania as in New England. Until about 1695 cows in Philadelphia were assembled at what is now the corner of Second and Dock streets every morning at a blast of the horn of the cowherd. He drove them to pasture and returned them to their respective owners at night.

When cattle were to be sold for meat the usual procedure was for the owner and the butcher to go into the woods and round up as many animals having the owner's brand as could be found.

Notwithstanding the general neglect of cattle, there were a few large herds. Gabriel Thomas informs us that in 1698, "Some farmers had Forty, some Fifty and from that Number to Two or Three Hundred Head of Cattle; Their Oxen usually weigh Two Hundred Pounds a Quarter." [31] By 1727 beef had become an important article of export. An Act of that year appointed "an officer for viewing, searching, packing or repacking and branding all beef and pork intended for exportation" and defined the size and dimensions of the containers. [32] In 1774 William Shipley of Philadelphia County had a herd of 100 cattle; herds of twenty to fifty were common. [33] In 1775 it was recorded, "Some Pennsylvania farmers have . . . four or five hundred head of horned cattle, oxen, cows, bulls, calves and young cattle." [34]

There was little improvement in feeding or breeding until after 1790. The cattle were mostly lean, rangy, variable as to type and color, and unproductive of either meat or milk. Cried one disgusted farmer in 1790, "These scimiter-ribbed, flat-sided, lubberly, big-legged cattle, what are they other than expensive masses of unimportant bone." In 1791 a Franklin County farmer reported to George Washington, "No more cattle is raised than can be supported by lowland meadows, swamps &c. and the tops and blades of Indian corn; as very few persons have attended to sowing grasses and connecting cattle with their crops." [35]

Triple-purpose cattle prevailed—for meat, milk and motive power. Beef, mostly from old cows and aged oxen, was salted down for home consumption. Few cows gave more than six quarts of milk a day.

"This mixed breed," said the editor of *The Cultivator* in 1838, referring to common stock, "are not celebrated for anything; some of them are good milkers as far as quantity is concerned, but as to quality of the milk and aptitude to fatten they generally fail. Their calves are of diminutive size, rarely giving more than twenty pounds per qr. when killed at four weeks old, seldom coming in till the third year and then requiring two or three years more to give them standing and character. They are small, short-bodied, thin and coarse-haired, steep-rumped, slab-sided, having little aptitude to fatten or lay on the fat at the right places."[36] This damning indictment was based on the ideal of a general purpose cow, one that was equally servicable for producing milk and laying on fat.

Impetus for better breeding came mainly from wealthy patrons of agriculture to whom farming was an absorbing hobby. They could afford to import animals of improved English breeds; most working farmers could not. Farmers were slow to take advantage of imported stock; for many years these were found only on country estates. After 1830 superior English cattle became quite generally distributed throughout the state, mainly for up-grading. The primary objective still was beef; not until after 1840 was much consideration given to superiority in milk production.

Devon cattle, which were developed by the Duke of Bedford beginning about 1760 were the first English breed to be imported. They were called a "triple purpose breed," being considered well suited to the plow, giving beef of good quality and milk of high butter fat content. But the animals were small and the milk yield low.

The first English breed to be imported for the specific purpose of improving native stock was the Durham, or Shorthorn. In 1783 a Mr. Gough of Baltimore and a Mr. Miller of West Virginia imported a number of this breed, which then was in the process of development by Charles Colling. The animals of this first importation were distributed to farmers of the Shenandoah Valley, Virginia, and the South Branch of the Potomac where the fattening of beeves on grass was fast becoming a major industry.[37] It is quite possible that descendants of these animals found their way to Pennsylvania, since many cattle from these districts were driven to Philadelphia to be finished for market.

Other importations of Shorthorns soon followed, especially in 1792, 1796, 1817, 1818 and 1837. Many of these animals came to Philadelphia. Shorthorns superseded Devons; they were used more than any other English breed to up-grade native stock. In 1824 John Hare Powel of Philadelphia began to import and breed "Improved Durham Shorthorns"; his dispersal sales of these animals were an important factor in the improvement of Pennsylvania cattle. In June 1830 he held a sale which nearly a thousand people attended. The average sale price of his twenty-one head that day was $320 each. More stress was laid on the value of this dual purpose breed for beef than for milk, although some "milking strains" of Shorthorns made fair records. Shorthorns made poorer oxen than Devons, being too large and too inactive.

Other European breeds of cattle, mainly English, were imported. In 1818 Ruben Haines of Germantown imported a pair of cattle from Alderney Island; these "Alderneys" may have been Guernseys; but the first authentic importation of that breed into Pennsylvania was in 1833. Jerseys were introduced into dairy herds near Philadelphia about 1840. Herefords, which were bred by Benjamin Tompkins of England beginning about 1760, were introduced into Pennsylvania in 1817, Ayrshires in 1820, and Aberdeen Angus much later. A few "Dutch cattle" were brought into the colony by early settlers but pure-bred Holsteins did not appear in this state until 1794, when they were introduced by the Holland Land Company.

After 1820 importations of all breeds of cattle were frequent; gentlemen farmers vied with one another for honors at livestock shows and at county fairs. Auction sales of pure-bred cattle were important social events in the vicinity of Philadelphia. Not until after 1840, however, did the herds of many Pennsylvania farmers carry the blood of these breeds; common stock continued to dominate them. There were few pure-bred herds but farmers began to upgrade their stock with pure-bred sires. This soon resulted in marked improvement in size, early maturity, quality and quantity of beef or milk, and economy of production.

Throughout this transition period a few farm leaders stoutly maintained that selective breeding of common stock and the development thereby of American breeds would give fully as satisfactory results as imported English breeds; but the weight of the evidence was against them, especially the time factor.

In 1809 the Pennsylvania Society for Improving the Breed of Cattle, commonly called "The Cattle Society," was organized in Philadelphia—the first livestock improvement association in America. From 1809 to 1814 it held annual or semi-annual cattle shows at which substantial premiums were awarded. The society did much to develop interest in superior livestock. Among premiums offered in 1809 were:

"To the person or persons who shall introduce into the state of Pennsylvania and keep for public use a bull of the North Devon, Sussex, Teeswater, Alderney or any other foreign milk breed which shall prove more valuable than the common breed of the country—One Hundred Dollars.

"To the person who shall import and keep for public use a bull of the Hereford, North Devon or any other breed whose stock shall be found to feed to the most advantage—One Hundred Dollars.

"To the person who shall originate from our native stock a breed of cattle which shall prove more valuable for milk than the common cows of the country—One Hundred Dollars." [38]

Similar premiums were offered for breeding superior sheep and swine. It is significant that these premiums, like those offered by the Philadelphia Society for Promoting Agriculture, were not merely for outstanding individuals or products, as in exhibitions of the present time, but to improve practices or breeds and to solve current agricultural problems.

Until after 1840 cattle were raised mainly for beef and only incidentally for milk. Beef was an important export commodity from the first settlements, but the industry did not attain commercial prominence until about 1750. Philadelphia then was the largest city and best market in America. Large droves of lean cattle were driven into Pennsylvania from Maryland, Virginia and even from South Carolina to be fattened on Pennsylvania bluegrass pastures before being marketed in Philadelphia.

In 1783 Schoepf reported, "At White's Tavern seven miles from the river [Susquehanna] we met a herd of black cattle which had come about 500 miles from the frontiers of North Carolina and was destined for Philadelphia. The handlers do not always find their account in this long-distance traffic. Shortly before, a herd had been driven by the place which could be sold at Philadelphia for only 9 Spanish dollars the head, 3-4 years old and weighing some 900 pounds. Not only do the cattle in so long a journey become thinner and worse-looking but the Pennsylvania farmer squints at the business because he himself raises enough cattle to overstock the market." [39] In 1758 Governor Dinwiddie of Virginia proposed to the legislature of that colony that a law be passed to prevent Pennsylvania drovers from coming into the Shenandoah Valley to buy cattle.

Beginning about 1780 cattle and other livestock were driven from western Pennsylvania to the Philadelphia market. Beef and pork on the hoof was about the only farm commodity that could be produced in that region for which a profitable market could be found, except corn or rye whiskey. Western Pennsylvania drovers met stiff competition in the Philadelphia market. In 1790 the *Pittsburgh Gazette* reported, "The *Western Farmer,* in discussing the cause for the depression in western Pennsylvania, raises the question of why they settled in western Pennsylvania instead of elsewhere and answered it, 'We adjudged that stock would be capable to carry themselves to market, either to Philadelphia, Baltimore or Alexandria, Virginia. Some of us have done it, but found it did not answer expectations, owing to the large droves of cattle from the back settlements of the Carolinas and Virginia.' "[40]

The marked increase in forage crop production and pasturage, beginning about 1790, together with high prices for beef resulting from the Napoleonic wars in Europe, greatly stimulated beef production. The area within seventy-five miles of Philadelphia became the outstanding beef producing center of the nation. Stock cattle were brought into it from western Pennsylvania, Ohio, Maryland, Virginia and the Carolinas and fattened on pasture, perhaps with a little supplemental grain feeding. Chester in particular, and also Delaware, Montgomery, Bucks and Lancaster counties were heavy producers of beef.

This was profitable farming. In 1795 La Rochefoucault reported that a Montgomery County farmer whom he had visited "buys lean cattle, from the fattening of which he derives a profit of fifteen, twenty or twenty-five dollars a head."[41] By 1819 the beef cattle industry was so profitable that good grazing farms in the vicinity of Philadelphia sold for $100 to $300 an acre.[42]

In 1828 William Darlington wrote, "They [stock cattle] are of various sizes, and the average weight in a lean state may be estimated at about 500 pounds; and when killed for beef at about 700 or 800 pounds. The greater portion are fattened on pasture during the summer but for fattening oxen a longer time is required and they are fed most successfully during the winter season. They [oxen] are usually fed about one year, running on good pasture through the summer and stall fed throughout the winter on meal made of maize and oats ground together."[43]

Beeves were fattened on Chester County pastures at the rate of thirty to fifty animals, often more, per hundred acres. The pastures were mainly bluegrass and white clover and were manured and limed heavily. The animals were shifted from field to field. "When the land is got into this state," said William Darlington, "it frequently rents for eight dollars per acre. By adopting a regular system of grazing, few hands are required. . . . The grazier calculates that one acre of rich native grass will make a thrifty steer fat in four or five months, which adds to his value one half—say he costs twenty dollars and when fat is worth forty."[44]

Droving

The period from 1810 to 1840 was the golden age of the drover. The urban population of eastern Pennsylvania was increasing rapidly. Access to this market from the farms of western Pennsylvania and the Ohio Valley was difficult. Except for a few turnpikes, roads were almost impassable at some seasons of the year. Canals and railroads were projected but not realized. Farmers of Lancaster and adjacent counties could take their produce to Philadelphia in great Conestoga wagons, but this was impracticable for farmers west of the Susquehanna River.

Livestock, however, could be made to transport itself to market even over poor roads. Droving, mainly cattle and swine, reached its zenith about 1830. Two grades of cattle were driven. A considerable number were stock cattle from western Pennsylvania, mostly three year old steers which were sold to farmers in the eastern counties for fattening. A larger number were cattle from Ohio, Indiana and Illinois that had been fattened on corn during the winter. In the spring they were driven slowly across the Alleghenies in herds of 100 to 200, arriving at eastern stock yards between April 15 and August 1. Most drovers followed the present routes of the Lincoln and William Penn Highways, and the National Pike. The first drove of cattle from the Scioto Valley, Ohio, to cross the Alleghenies was in the spring of 1805. It sold in Baltimore at a net profit of $31.77 per head.[45]

Drives were made only in late spring and summer because dirt roads were almost impassable at other seasons. The approach of a herd could be seen miles away by the enveloping cloud of dust. When fat cattle were driven it was customary to have an equal number of stock hogs accompany them to eat grain that the cattle wasted. Droves of stock cattle averaged nine miles a day, fat cattle seven miles, cattle with hogs five miles. Thus from thirty to fifty days were required between Pittsburgh and Philadelphia. The drover's life, though leisurely at times, had periods of strenuous activity, especially when stock strayed off the highway or became tangled in other traffic.

Historians of western Pennsylvania have recorded the droving era of that region. Says W. J. McKnight, "The Susquehanna and Waterford pike was completed in 1824 and cattle and other droving commenced in 1825. I have seen passing through Brookville on their way East from four to six droves of cattle a day. The droves were generally divided into three sections. At the head of the first would be a man leading a big ox, his extra clothing strapped on the ox's head. The man would be crying out ever and anon, 'K-o, b-o-s-s' (Come, boss). I have seen two or three droves of sheep pass in a day, with occasional droves of hogs sandwiched between them. Horse droves were numerous, too . . . and a few flocks of turkeys. Droving began in June and ended in November."[46]

Cattle droving was an important industry of Erie County before railroads were built. Says Benjamin Whitman, "Cattle were collected annually and driven across the mountains in droves of one hundred to Berks, Lancaster and other counties convenient to Philadelphia. Two men and a boy with as many horses usually managed a drove. The trip took from two to three months."[47]

Reminiscing about olden times, a Fayette County farmer who traveled the National Pike in his youth says, "I have stayed over night at William Sheets' Tavern on Nigger Mountain when there would be . . . one thousand hogs in enclosures and as many fat cattle in adjoining fields. The music made by this large number of hogs eating corn on a frosty night I will never forget."[48]

Not always did the drover receive a fair return for his labor. Market prices were subject to sharp fluctuations and he had no means of keeping posted; speculators met drovers a few days' journey from the city and often took advantage of them. Stock driving over Pennsylvania mountains ceased about 1850 when trunk line railroads began to provide through transportation. It was a colorful chapter of agricultural history.

Between 1790 and 1830 soiling or stall feeding was practiced by a few farmers. One of the pioneers was William West of Delaware County who fed his cattle in the barn five or six times a day during the summer, hauling fresh-cut forage to them. Israel W. West of the same county was another successful stall feeder. Even so eminent an authority as John Beale Bordley contended vigorously that soiling "is much more advantageous than pasturing," primarily because it resulted in the maximum amount of manure. Soiling had been practiced to advantage in Germany where labor was much cheaper than in America. Here it soon was found that even the larger amount of manure did not compensate for the added labor; pasturage was more practicable.

Stall feeding of beef cattle in winter, however, became established in the southeastern counties about 1800 as a supplement to pasturage, especially in fattening aged oxen. At first the cattle were fed nothing but forage; they were put in separate pens and "fed the most luxuriant hay. There is a prevailing opinion that beef is firmer and in all respects better when fattened upon grass than upon grain."[49] Soon, however, grain was added to the ration. Lancaster County, with its bountiful crops of grass and grain, became the center of the stall-fed beef industry of the state, a preeminence which it holds to this day.

THE FAT CATTLE CRAZE

Between 1790 and 1830 there was a craze for aged cattle of enormous size. Fortunately this was confined to wealthy amateurs who could afford to pay for the high cost of this surplus flesh. They were patterning after English fanciers to whom huge show cattle then were the rage. In vain did a few farm leaders such as John Beale Bordley protest against the production of such uneconomic animals. "To reach the size demanded," he said, "the imported English cattle are bred in-and-in until the beef produced became so coarse as to be almost uneatable."

The mammoth creatures, however, made a sensation at exhibitions. Here is a record of some of these monstrosities:

"On August 4, 1801, there was exhibited in Reading an ox raised in New Jersey described as over 6 feet high, over 12 feet long and weighing over 3000 pounds."[50] Another record describes "A steer six years old raised by Wm. Guier of Philadelphia. Live weight, 2387 lbs."[51]

In 1811 the Philadelphia Society for Promoting Agriculture offered a premium of $100 "To the person who shall raise and feed an ox, steer or cow whose weight of meat beef shall be at least 1500 lbs. and have 300 lbs. of rough tallow." It was won by "Mr Carpenter" with an eight year old ox weighing 1668 lbs.[52] Other records contain such announcements as these: "An ox was killed last winter in Philadelphia the quarters of which weighed two thousand two hundred and some odd pounds; and he was sold to the butcher for one thousand three hundred dollars."[53] "An ox . . . raised by the Harmony Society at Economy was slaughtered here last week. The weight of the animal alive was 2556 lbs."[54]

In March, 1821, when the fat cattle craze was at its height, a show was held at Philadelphia called "Pennsylvania Against the World." The cattle were exhibited in stalls for four days then were slaughtered and their quarters carried about the city in formal procession. The stated purpose of the show was "to improve the breed of cattle." To this display James Mease registered vigorous protest: "A number of large-framed oxen with capacious bodies, some of them eight or nine years old, are selected and after the fullest allowance of the finest pasture . . . are put up in the winter and fed at regular hours with as much Indian corn meal, ground oats, potatoes, pumpkins and hay as they can possibly digest, until they groan from the oppression they suffer . . . From one to even four years of this treatment are required. . . . Let me ask how any of these operations will 'improve the breed of cattle'? Did any of these crammed beasts leave their progeny behind them? . . . Plain reason and sound sense dictate that what we require is a breed that will soonest furnish the greatest quantity of good meat at the least expense."[55]

After 1840 the beef cattle grazing industry of southeastern Pennsylvania began to decline; it could not meet the competition of beef from Ohio and westward which was produced more cheaply and marketed by rail. Gradually dairying supplanted beef production. By 1850 beef production was restricted mainly to stall feeding in Lancaster County where conditions were most favorable for it—heavy corn production and a system of intensive farming that required large applications of manure. Many Lancaster County farmers continued to fatten ten to twenty steers a year, most of which were bought from western drovers. Grain previously sold to distilleries was marketed in this more profitable form.

BIRTH OF THE DAIRY INDUSTRY

The nondescript cattle of the colonists were valued chiefly for their meat, hides and as a source of motive power—milk was a by-product. Not until about 1830 did dairying begin to emerge as a commercial enterprise. For many years it was common for the town-dweller to keep one or more cows which roamed the streets and fields. Dairying on the farm was mainly to provide butter and cheese which could be sold in nearby towns or bartered for goods at the country store. The dairy was one of the multifarious duties of the farmer's wife, both milking and the manufacture and sale of milk products. The market for fluid milk was limited not only by inadequate transportation facilities but also by habit. Colonial people were not milk drinkers; they preferred more stimulating beverages.

Milk yields per cow were very low. "Where the pasture is fair," said Acrelius in 1759, "a cow does not give less than two quarts of milk at a time—that is, twice a day." [56] There was not much improvement until after 1790 when the more general culture of forage crops supplied the half starved animals with a larger volume of raw material to turn into milk. In 1791 Richard Peters of Philadelphia stated, "A dairy of 8 cows should give an average of 2 pounds of butter per week for each cow, making an average through the year of 104 pounds." The general average at that time was nearer 85 pounds.

In 1794 Thomas Cooper called "Mr M'Allister, of Paxtang, Lancaster County, the most intelligent farmer we have met; his cows, besides clover and timothy hay, have potatoes mixed with ground Indian corn and the waste of the distillery," [57] which probably was on the farm. After 1800 average production gradually increased as a result of better feeding and better breeding.

Excellent butter often came out of colonial springhouses even though little was known of the necessity for sterilizing utensils and no refrigeration was available but cold spring water and sometimes ice. These were inadequate in hot weather. Butter made during the summer could be salted down in firkins and kept sweet in the springhouse until winter when it could be sold at a higher price.

Delaware County had an enviable reputation for the quality of its butter. This was churned from cream or from whole milk. Butter making in Delaware County from whole milk, about 1840, is described in the *Cultivator:*

"The milk is strained in pans or oaken tubs, holding two pails full. Everything is done in the cellar. The milk is not meddled with until it has coagulated, when each day's or each half day's milk is put in the churn with an equal quantity of water, cold in summer warm in winter, to bring it up to the proper temperature, which is 55 to 60 degrees. The churn is made in barrel form, of oak, hooped with iron. For six or ten cows the churn should hold 30 gallons. They rarely exceed two barrels, as in large dairies they prefer to churn several times a day. Churning is never done by hand except for a single cow. In small dairies the churn is worked by a dog or sheep, the latter being preferred; the larger dairies have water or horse power."

The farmer's wife took competitive pride in the quality of the butter that she sold to year-around customers—the village doctor, lawyer, banker—or to the village store. She was paid fifteen to twenty cents a pound by private customers when the local store-keeper paid only ten to twelve cents "in trade." Production for sale as fluid milk was limited to farms near cities and towns where delivery could be made daily. In 1800 retail marketing of milk in Philadelphia was quite similar to that in New York: "A man carrying two large kettles from a yoke on his shoulders trudged through the streets and called out, 'Here's the milk, Ho!' Some farmers near the city drove around in carts which were mostly covered and sold milk for six to ten cents a quart." [58]

In 1806 the Philadelphia Society for Promoting Agriculture offered a premium of a silver medal, or fifty dollars "To the person who shall exhibit to the society an account of the profits of the best dairy, applied to butter or cheese. Not less than twenty cows. . . . The object is to induce an attention to the breed and selection of dairy cows. Their points and qualities differ from those proper for breeding beef cattle. . . . Much depends, even with the best stock, on regularity and attention in the dairy woman." [59] This challenge was accepted by Algernon Roberts of Philadelphia County. In 1807 he reported, "An account of the butter I sold from a dairy of twenty cows during eight years, viz: from 1st January, 1796 to 31st December 1803." The average yield per cow was 173 pounds of butter a year. He presented the following record of income and outgo:

"Receipts for Eight Years"

"Cash received for butter sold from 20 cows in 8 years	$8,276.19
Consumed in family the milk of 3 ditto.	1,506
Sucking pigs estimated at	320
17 cwt. of pork at $6 per cwt. sustained by the dairy	816
20 calves (a year) at $4 each	640
Total receipts for 8 years,	$11,558.19

"Annual Expenditures"

"20 cows at 30 dollars each is $600 at 6 per cent	36.
Grain for winter feed	300
Hay, straw &c.	300
A man and woman's wages	300
78 times expenses going to market at 25 cents per time	19.50
Summer keeping of a bull	13
Total yearly	$968.50
Total expenditures for eight years	$7748

"The net profit, then, is $3810.19 for eight years; this sum divided by eight gives $476.27, which being again divided by 20 (the number of cows) will give the average per head, viz. twenty-three dollars and eighty-one cents." [60]

An economist might raise an eyebrow at the lack of a charge for interest on capital investment and the absence of several other items; nevertheless this account presents an interesting comparison with present conditions.

By 1830 it had become evident that dairying to meet the needs of the rapidly growing metropolis of Philadelphia was a more profitable type of livestock husbandry in nearby counties than beef production. "Our pastures within the reach of the city markets," said S. S. Ingham of Bucks County in 1827, "are more profitably employed in supporting stock for the dairy, while those at a distance have a decided advantage in raising cattle for beef."

Marked improvement in breeding followed. Some of the more radical farm leaders advocated the slaughter of all common stock and their replacement by pure-bred animals, especially Shorthorns. Most farmers demurred; they held that as between Shorthorns and common stock the latter were better suited for dairy purposes however superior the Shorthorns might be for beef. "Our native cows are an excellent stock," said S. S. Ingham, "and more attention has probably been paid to their improvement than to any other animal. Every farmer's wife within a hundred miles of Philadelphia has one or more excellent cows, the offspring of the best of a favorite stock which has been improving in the family for an age. To these we have lately added some imported breeds, including the Alderney, distinguished for the richness of their milk but rather ill-favored as to form. A judicious cross of these with the best native stock promises an essential improvement in our dairy cattle.' [61] This point of view prevailed; most of the dairy herds of that period were common stock that was being upgraded by the use of pure-bred sires.

A controversy over "dual purpose cows," mainly Shorthorns, raged fiercely between 1810 and 1840. John Hare Powel of Philadelphia, leading importer of "Improved Durham Shorthorns," added fuel to the flames by frequent reports on the superior milking qualities of his stock. "So rich was their milk," he said, "that I saw perfect butter produced from the cream by means of the friction of a spoon on a plate. It yielded butter of fine flavor in less than ten seconds." Reputable witnesses corroborated his statement but said the time required was one minute.[62] In 1840 "Dairy Maid," a Shorthorn owned by James Gowen of Mount Airy, was reported to have yielded an average of thirty-three and one-half quarts a day four months after freshening.[63]

Notwithstanding these exceptional records of milk production most farmers kept Shorthorns for beef rather than for milk. The prevailing opinion was expressed by S. S. Ingham of Bucks County in 1827: "It may well be doubted whether these cattle, which have a peculiar predisposition to fatten, are the best stock to propagate for the dairy; it is not to be believed that the digestive organs can convert aliment into flesh without a comparative diminution of the supply for the udder." In 1823 Robert Haines of Germantown protested against the efforts of English breeders to develop animals that "would excell in all three points—the pail, the yoke and the knife." He strongly advocated Alderneys for butter. One of his Alderneys produced "ten pounds of delicious butter from twelve quarts of her cream obtained from fourteen milkings; that is, in one week. Her only food through the winter has been good hay and brewer's grain."[64] Not until after 1850, however, were the major milking breeds well represented in Pennsylvania dairies.

Philadelphia early became noted for superior butter and cheese. "The butter and cream-cheese to be found in the Philadelphia market in the spring and summer are such dainties as are found in no other place. They are produced on dairy farms near the city whose energies have for several generations been directed to this one useful end and who now work with an art made perfect by the experience of a century."[65]

Although there were a few high records, average production and profit per cow were low. In 1836 the editor of *Farmers' Cabinet* asserted, "A milch cow of medium quality in this state will give . . . 1500 qts in a year . . . or 166 pounds of butter worth 16 cents per pound, making $26.56. The skim milk is worth say $3.44, making a total income for the year of $30.00. . . . Nothing is said of the worth of the calf as all the milk is credited. A milch cow's keeping one year cannot be short of $25 in the interior, leaving a net profit of only $5.00 a year per cow."[66] He urged that no cow producing less than 3000 quarts a year be kept. Average production per cow doubled in forty years, from about 82 pounds of butter in 1800 to 166 pounds in 1840. This was before the Babcock test and milk scales came into use as a means of detecting unprofitable cows.

Butter and cheese, mainly butter, dominated Pennsylvania dairying until after 1840. In the vicinity of Philadelphia, Pittsburgh, Reading, Lancaster and a few other towns milk from nearby dairies was an increasingly important market commodity; but not until railroads made it possible to ship into the city milk from farms many miles distant, after 1840, did the fluid milk industry become prominent.

SWINE

Swine were close competitors of cattle as the most important livestock of colonial Pennsylvania. They multiplied rapidly and required little care, for they lived on the products of the woods and fields, mainly mast—acorns, beechnuts, chestnuts—and various roots. Salt pork was a staple in the colonial bill of fare, especially on farms. Herds of swine roamed the forest which was as favorable a range for them as it was unfavorable for sheep. Soon they became almost as truly denizens of the wild as deer; when desired for meat they were hunted and shot like wild beasts. Were it not for the depredations of wolves, bear and panthers, against which they were comparatively defenseless, save for their speed, swine would have rivaled deer as a source of wild meat. Bear were particularly fond of pork.

All the early Dutch, Swedish, English and German colonizing expeditions brought swine; they were much more easily maintained on the long sea voyage than cattle. Swine had been introduced into the New World more than a century before the Dutch first sailed up the Delaware; by Columbus into the West Indies in 1493; by De Soto into Florida in 1538; by the English into Virginia in 1608; and by the Dutch into New York in 1625. In all these places they adapted themselves to the new environment better than any other farm animal.

The swine of early colonial days were razor-backs. They had a narrow body, long snout, arched back, large bones. They were better qualified to serve as subsoilers than to fill the pork barrel. Running wild, swine degenerated toward the wild boar type of Europe from which they had sprung—lean, swift, fierce. They could out-run and sometimes outfight most of their forest enemies.

It was difficult, if not impossible, for a farmer to distinguish his own swine unless they were branded. A few farmers attempted to herd their swine in late autumn and fatten them on corn for the export trade but most of the packed pork was as wild meat as venison. Pork packing to supply ships bound for the West Indies was an important industry of colonial Philadelphia; it would have become larger if salt had not been scarce and dear.

Swine roamed the forests for more than a century. In 1798 Parkinson, an English farmer, described what he saw here, with the complete absence of enthusiasm that most English farmers showed for American agriculture: "The real American hog is what is termed a woodhog; they are long in the leg, narrow in the back, short in the body, flat on the sides, with a long snout, very rough in their hair, in make more like a fish called a perch than anything I can describe. You may as well think of stopping a crow as these hogs. They will go a distance from a fence, take a run, and leap through the rails three or four feet from the ground, turning themselves sideways . . . It is customary to keep them in the woods all winter . . . and they must live on the roots of trees or something of that sort. They are poor beyond any creature that I ever saw."[67] Parkinson was not an unprejudiced observer, but undoubtedly the razor-backs lacked something of the finish of English pen-fed hogs.

More accurate, perhaps, was the account of Gabriel Thomas a century earlier: "They have great stocks of Hogs kept in the Woods. . . .

I saw a Hogg Kill'd of about a Year old, which weighed Two Hundred weight; whose Flesh is much sweeter and even more luscious than that in England, because they feed and fatten on the rich (though wild) Fruits, besides those fattened at home by Peaches, Cherries and Apples."[68] This "luscious" pork must have been produced in a year of good mast, especially beechnuts, which were preferred by hogs. It was axiomatic that a good beechnut year was a good swine year.

When swine roamed the forest it was easy to shoot or steal them. Legal measures were of little avail. In 1672 it was enacted, "Forasmuch as many and great Complaints have been made against Hogg Stealers. . . . It is ordered that the person soe offending . . . shall for the first Offence, beside a fine to be imposed by the Court, receive the Corporate punishment of having one of his Ears cutt off."[69] Indians soon acquired a taste for pork, preferring it to venison. In 1686 the Provincial Council received a complaint against Indians from farmers in the Welsh Tract, near Haverford, "for ye Rapine and Destruction of thir Hoggs." Thereupon the Council ordered, "Ye respective Indian Kings with all speed should be made to desist their warriors from making these raids."[70] There is no evidence that the red men did desist. The barbarous punishment of the law of 1672 (ear cropping) was repealed by William Penn who provided that for the third offence, the punishment was to be twenty-nine lashes and banishment from the colony.

Hog stealing was a source of much bad feeling between neighbors. In 1687 the Court of Chester County recorded, "John Hendrickson saith y^t y^e last fall he was up mill or Darby Creeke where he heard two gunns goe of and when he came to y^e place he heard dogs barque & Thomas Boules with his Gunn Presented and did Shoote at his Neighbor's Hogs . . . and that Boules was an Old ffoole for shooting twice and missing."[71] Apparently the unpardonable sin, in the eyes of this sturdy pioneer, was not stealing the hog but "shooting twice and missing." Dogs were a menace to hogs as well as to sheep. In 1686 the Grand Jury of the Court of Chester County "doe also present Anne Neales, Widow, for keeping and harborring doggs that worries and kills her neighbor's Hoggs."

On the western frontier swine ran at large long after they were confined in the older settlements. Speaking of the "woodhog" of Jefferson County about 1840 W. J. McKnight says, "He was a racer and could outrun the average horse. His snort when startled was something terrible. He was of the razor-back variety, long-bodied, long-legged and long-snouted. By means of his snout he could plow through everything." Not until after 1850 were hogs generally confined.

Every farmer was supposed to brand his swine with a distinctive mark which was recorded by the County Court. This was accomplished with difficulty and often was ignored. In 1676 several Swedish farmers petitioned the Court at New Castle "desiring that this Court would give them Leave, when they fetch in their old outlying hoghs, to Marke the Joung ones that shall be wth them in the p^{r}sence of their Neighbors." [72]

Swine running at large in towns soon became objectionable even though they served as scavengers by eating the refuse thrown into the streets, as was the unsanitary custom of that time. In 1699 it became unlawful for hogs without yokes about their necks and rings in their snouts to be at large in Chester. An Act of Assembly in 1705 provided, "No swine shall be suffered to run at large without . . . rings in their noses sufficient to prevent them from turning up the ground, and triangular or three cornered yokes or bows about their necks." [73] Presumably this law was intended to apply only to swine in towns; if not, it was generally disregarded by farmers. Peter Kalm reported in 1749 that swine without yokes and rings could be killed by anyone.

Pennsylvania led other colonies in the export of salt pork, mainly for provisioning fishing fleets and for sale in the West Indies. An Act of Assembly in 1727 provided for the appointment of an officer "for viewing, searching, packing or repacking and branding all beef and pork intended for exportation," and defined the sizes and dimensions of the containers.[74] After 1700 nearly every farmer raised swine, mostly of the woodhog type. After supplying his family with salt pork and bartering at the country store for household necessities usually there was a surplus to sell.

As the wild supply of mast and fleshy roots diminished, swine fed more on the farm and less in the woods. They were fed kitchen and dairy wastes, sometimes a little grain. Swine husbandry about 1800 is described by Charles W. Janson: "Large herds of swine, which ran off at my approach . . . stray many miles from their owner who, however, is anxious to accustom them to resort to his plantation. To effect this, he blows the conch-shell which may be heard a great distance. At this signal the hogs that are well trained set off at full speed . . . and are rewarded with Indian corn . . . About the end of November begins the pork season. Neighboring farmers unite and form a large party in quest of herds of swine that are entirely wild, which they pursue and shoot with a single ball in the head. Each farmer knows his hogs by marks which are given them when young . . . The swine are very fat but the flesh is not firm, from the animals feeding chiefly on acorns; this they call mast-fed pork." [75]

Gradually it became customary to capture and pen woodhogs after grain harvest and fatten them on corn for slaughter. Potatoes, beans, peas, apples and peaches were used as supplemental feed. Farmers near breweries or distilleries commonly fattened hogs on barley, corn and rye by-products of beer and whiskey making. Sometimes shoats were brought to the distillery where they were confined and fed until fat. Near towns large numbers were fattened on the offal of slaughter houses.

It was customary to slaughter hogs at about eighteen months, when they averaged around 200 pounds. Some farmers kept swine for two winters, others for only ten or twelve months. In line with the prevailing craze for mammoth beef cattle, a few show swine were kept for several years until they attained great size. In 1812 one such animal was slaughtered when four years and ten months old; it weighed 834 pounds, dressed.[76] Such behemoths captivated the size-obsessed visitors at livestock exhibitions and county fairs; as did also the freak "pig with a wooden leg on the off side before, which appears to walk with little lameness or inconvenience." [77]

A beginning was made in the improvement of swine about 1800 when the Duke of Bedford made a consignment of his Woburn breed to George Washington. This breed is now extinct. These hogs, if well fed, would weigh 400 to 600 pounds when a year old. Beginning about 1820 a number of Chester County farmers developed the Chester White by crossing Bedford stock with the best native whites. These became famous throughout the nation and still are a leading breed. After 1820 other English breeds were imported, mainly Cheshire, Essex and Berkshire. By 1830 Berkshires were being imported in large numbers. They created a furore; "Berkshire fever" raged between 1838 and 1841. Speculation ran high and prices soared to stratospheric heights. Some wild-eyed enthusiasts paid $500 for a pair of Berkshires. The collapse of the "boom" came in 1842, leaving disillusionment to many and bankruptcy to some.

Imported Berkshire boars were bred to native sows, with marked improvement. Coming to maturity early, swine are quickly modified as to type. A well bred boar pig could be purchased for a few dollars. By 1840 native stock had been largely displaced by cross-bred swine of large size, short legs, small bones, early maturity and economical pork production.

About 1810 competition from the West began seriously to affect the market for Pennsylvania swine. Cheap land and cheap corn made it possible for Ohio and Indiana farmers to produce pork at a lower cost than most Pennsylvania farmers. Between 1800 and 1830 herds of corn-fed hogs from the Mississippi Valley were driven slowly over the Alleghenies to Philadelphia and Baltimore; sometimes they accompanied herds of beef cattle. In 1810 it was estimated that drovers brought 40,000 hogs annually to eastern cities; most of them came from west of Pittsburgh. In 1840 the average cost of producing pork in the prairie states was two to two and a half cents a pound as compared to about six cents in Pennsylvania.

Soon after 1840 railroads brought western hogs into Philadelphia and Baltimore to be slaughtered for domestic use and for export. A few years later Cincinnati was the center of the meat packing industry, but soon relinquished the crown to Chicago. Thereafter most Pennsylvania farmers found it expedient to keep only enough swine to consume the wastes of the household and dairy; a few continued to raise swine in moderate number to supply local markets. As the dairy industry developed, swine were kept on dairy farms at a profit.

SHEEP

Sheep raising in colonial Pennsylvania was a precarious business; the flocks were harassed by bear, wolves and dogs. Sheep were more difficult to rear than swine under poor shelter, poor food and general neglect. They could not shift for themselves in the woods, like swine. The foreign market for wool was uncertain and the domestic market limited. Most farmers raised only enough sheep to clothe their families. Wool, not mutton, was the primary objective. For many years there was a strong prejudice against mutton, which softened and deteriorated rapidly even when smoked or salted; hence the derisive term "muttonheaded".

All early importations of livestock from Europe included sheep. They were brought to the West Indies by Columbus in 1493; to Florida by De Soto in 1565; to Virginia in 1609; to Massachusetts in 1624 and to New York in 1625. Dutch and Swedish pioneers on the Delaware brought sheep from Holland and Sweden. Instructions from the Swedish Crown to Governor Johan Printz commanded, "Above other things he shall direct his attention to sheep, to obtain them of good kinds . . . so that presently a considerable supply of wool of good quality may be sent over to this country." [78] Some sheep were brought from Rhode Island.[79] In 1698 Gabriel Thomas reported that sheep were in "considerable numbers, which are generally free from the infectious diseases which are incidental to these creatures in England, as the rot, scab or maggots. They commonly bring forth two lambs at once, some twice in one year, and the wool is very fine and thick." [80]

Not enough wool was produced to clothe the colonists; in 1701, the Provincial Council "Resolved; That it be proposed to the Assembly, That every person throughout this Province and Territories who has 40 acres of clear land shall keep at least ten Sheep." The Assembly, however, wisely decided not to embark upon a program of compulsory sheep husbandry.

The sheep of colonial days were sorry-looking creatures. They were so scrawny that a disgusted English farmer, Richard Parkinson, snorted, "They look surprisingly like goats." During the winter they "feed themselves on ferns," says Acrelius, "and the young grass which grows up under the snow in warm weather. The lambs skip about in the snow and stand in danger of being buried under it." As late as 1778 Captain Heinricks, a German officer, recorded, "There are plenty of sheep, but as the farmer drives them into the woods he loses the wool; however he sells the skin for 8 shillings." [81]

The sheep of this period were small, long legged, narrow in breast and back and slow to mature. They stood about two and a half feet high and weighed only ten to fifteen pounds a quarter when dressed. The clip was two to three pounds of coarse, short staple wool which was used in the household manufacture of home-spun.

Wolves took heavy toll of flocks until after 1800. When the farmers of western New York organized a mammoth wolf drive and harried thousands of wolves over the line into Pennsylvania, their neighbors in this state were justifiably resentful. In 1796 the ravages of dogs in Bucks County were so serious that farmers petitioned the General Assembly for relief.[82] In 1809 dogs were taxed in Philadelphia, Bucks, Chester, Delaware and Montgomery counties and the money used to pay for sheep killed by dogs.

Although sheep were kept mainly to clothe the family, the commercial woolen industry began at an early date. About 1690 "a large flock of sheep was kept in the town liberties [Philadelphia] and a woolen manufacture was already at work making good stuffs and Sarges."[83] The industry grew slowly because of British opposition. Not the least of the many obnoxious regulations imposed on the colonies by Great Britain was that of 1699 which forbade them to export wool or woolen goods to one another or to any other country than Britain.

Before the Revolution the colonies were dependent on Britain for all woolens except homespun. Increasing resentment over British taxation and other repressive measures led to efforts to be independent of the mother country in the manufacture of woolens and other commodities heretofore imported. The "United Company for Promoting American Manufactures" was organized at Philadelphia. A group of butchers in that city signed an agreement to slaughter no sheep, in order that more wool might be produced.[84] In further defiance of Britain, it was considered to be the duty of every patriot to wear homespun at all times, especially at public functions. At the outbreak of the Revolution the General Assembly passed a resolution urging farmers not to kill sheep for meat but to keep them for breeding purposes. Importation of British woolens having ceased, domestic wool was needed to clothe the continental army and civilians; so the woolen industry flourished for a time.

At the close of the Revolution and until 1800 British woolens again came to America in quantity and were sold at a price against which the infant American industry could not compete. Sheep husbandry languished, in spite of successive tariffs, each higher than the preceding—five per cent in 1789, seventeen and one-half per cent in 1807 and thirty-five per cent in 1812. Not until after 1830 did the woolen industry become firmly established.

The low condition of sheep husbandry during the early post-Revolution period is revealed in a report by Richard Peters of Philadelphia to George Washington in 1791: "For some time hence this will not be a great sheep country," he said. "The dryness of our seasons burns up the pastures for a great part of the year; we keep too many dogs, who destroy them; and our country is much intersected with mountains inhabited by wolves, which cannot be extirpated. Our long winters are inimical to sheep . . . they render the keeping of them expensive and subject the animals to numberless disorders. We can have no succulent or green forage; turnips are out of the question, our snows and severe winters destroy or cover them. As to fleece, it is but scant, three pounds per sheep being rather an over-calculation. Wool is now in some demand but I have known it unsalable . . . I know none who have tried the sheep business that have succeeded." [85]

The gloomy picture painted by Judge Peters was soon brightened. He spoke on the eve of the "great awakening" in Pennsylvania agriculture, which centered around the use of land plaster and lime. This quickly resulted in more grass and clover, better pastures and more profitable sheep husbandry.

Little effort was made to improve the type of sheep until after 1800. Through the work of Robert Bakewell in England, between 1765 and 1790, marked progress had been made in sheep breeding. The Leicester or Bakewell breed developed by him attained great popularity. A few of these precious animals were smuggled into Pennsylvania in spite of the strict embargo imposed by the British. Their numbers were too few, however, to have any appreciable influence in upgrading native sheep.

The few Pennsylvania breeders of that day soon found, as did their English contemporaries, that the Bakewell method of in-and-in breeding ultimately resulted in deterioration. This was stated by James Ecroyd of Philadelphia in 1812: "By breeding in-and-in a constant deterioration has taken place; the bone becomes smaller and perhaps for the second and third generation the shape rather handsomer, but a continued diminution of size takes place; perhaps, however, the greatest defect is want of increase, arising both from the barrenness of the ewes and the lambs being so weak and sickly as to die in great numbers." [86]

One of the major handicaps to breed improvement was the practice of allowing sheep to run at large where they bred with rams of all degrees of excellence or inferiority. By 1800 this practice had been largely discontinued in the southeastern counties but it was prevalent west of the Susquehanna for several decades thereafter. In 1813 the General Assembly passed "An Act to Improve the Breed of Sheep in Certain Counties" in central and western Pennsylvania.[87] It imposed penalties for allowing rams to run at large.

The collapse of the "Merino Craze" in 1816 turned the attention of farmers from fine wool to mutton breeds. They began to improve their flocks by crossing native ewes with rams of English breeds. In 1824 John Hare Powel outlined the breed situation: "The different flocks of sheep called Bakewell which are found in New Jersey, Pennsylvania, Delaware and New York are a mongrel race derived principally from an importation of Dishley, Teeswater and Southdown sheep . . . Individuals with smutty faces, finer wool and smallest frames are indicative of Southdown origin; the largest frames, coarser bone, heavier offal and larger heads mark others of the Teeswater race; the long wool, often twisted at the ends, the narrow faces, broad backs, short legs, and fine bone prove the presence of the Dishley or Bakewell blood."[88]

After 1830 English mutton breeds, especially Southdown, gradually displaced Merino and other breeds and "native" stock. One of the earliest importations of Southdown was by John Hare Powel in 1825.[89] By 1836, according to Joseph Cope of Chester County, "The Southdowns are now taking the lead, so much so that the Bakewells (Leicester) are but little talked of."[90]

The embargo of 1808, the "non-interference acts," and the War of 1812 cut off the importation of foreign woolens. Immediately small woolen mills sprang up all over the state. The price of domestic wool rose rapidly and farmers began to expand their flocks. Between 1808 and 1817 there was a prodigious development in sheep husbandry. At the close of the War of 1812 trade with Britain was resumed, English woolens again dominated the American market, and there was a sharp drop in the price of wool.

The "Merino Craze," which swept the state betwen 1810 and 1816 was one of the wildest speculative orgies of American agriculture. Merinos were a fine-wool breed developed in Spain. The period of non-intercourse between European countries resulting from the Napoleonic wars stimulated wool production in America. A few Merinos were imported by William Foster of Boston in 1793 but made little impression then. In 1809 and 1810 Spain was invaded by Napoleon and was compelled to relinquish her monopoly in fine-wool sheep and disperse her flocks.

Taking advantage of this situation, in 1810 and 1811 the American consul at Lisbon shipped about 20,000 Merinos to America. They created a furore. Merino wool sold for seventy-five cents a pound in 1811; two years later for $2.00 to $3.00 a pound. Common wool then was less than forty cents a pound.

Fabulous prices were paid for breeding stock. In 1810 there was published anonymously at Philadelphia, "Antidote to the Merino-Mania." The author advised farmers to "look before you leap." He said, "We have heard it stated that $500, $1,000, and even $1,500 have been paid for a Merino ram." He advised, "The business is likely to degenerate into a mere system of speculation which, whilst it benefits a few, will bring ruin to thousands."

This wise counsel fell on deaf ears. From Bucks County comes this account of the ravages of the "fever" in that usually conservative community: "The Merino-sheep mania, or fever, raged in this county from

1810 to 1815. Full-blooded Merinos sold as high as $300 to $500 each and in a few instances they brought $1,000 . . . A man in this county sold his wheat crop, 200 bushels, at $3.00 a bushel and gave the whole of it for one sheep. When the fever subsided these same sheep dropped to $5.00 and $10.00. Many persons were ruined; one man lost $16,000." [91] In 1811 a Philadelphia physician reported, "Upwards of 750 Merinos have arrived in this city within the last three Months. They have been Sold as low as 50 dollars by Auction, but the Consignees have preferred putting out the rest of the flock to the Shares; giving one half of the lambs but reserving the wool." [92] At the height of the craze, in 1811, the "Merino Society of the Middle States" was organized in Philadelphia.[93]

The fever subsided suddenly, in 1816, leaving the patients weak and emaciated in pocket-book. In January 1816 Merino wool sold for $7.06 a pound in New York; in October of the same year for sixty-eight cents. The wool of Merinos, though fine, was short. Moreover, the flesh was not considered suitable for human consumption; it was even said to have a bad odor.[94] Grievously disappointed, many farmers ruthlessly sacrificed their flocks. "A very respectable butcher assured me that he bought for one dollar a head a flock of Merinos among which was one imported ram who, the owner declared, and I have no doubt truly, had cost him one thousand dollars." [95]

The high point of sheep husbandry in Pennsylvania was reached in 1830-1840. Encouraged by high tariffs, manufacture of woolens increased rapidly, mainly in small country mills. Shipments of sheep and wool from Ohio and westward were not yet large enough to cause serious concern. Merino wool, which had sold for forty to fifty cents a pound between 1825 and 1829, jumped to seventy cents. Many farmers, even those who had been pinched in the previous Merino squeeze, enlarged their flocks. Some took leave of their common sense again and turned practically all of their farms into sheep pasture.

After 1840, with constantly increasing competition from the West, sheep husbandry declined rapidly. This is evidenced by Census statistics of the sheep population of certain southeastern counties in 1840 and 1850:

	1840	*1850*
Chester	56,700	13,400
Lancaster	41,967	19,876
York	36,347	13,531
Bucks	27,244	14,579
Adams	19,140	7,723

Between 1840 and 1850 the number of sheep in Pennsylvania decreased over sixty per cent. Large numbers were driven into Ohio, Illinois and westward to meet the demand there for breeding stock. Washington

County, which had more than 80,000 sheep in 1824, was the most important reservoir of breeding stock for western farms. In 1823 "more than 10,000 head of sheep were taken from Washington County and they were scarcely missed." [96] Of a total clip of over 400,000 pounds in that county in 1825 it was estimated that three-fourths would be used in household manufacture and the remainder by factories.[97] Wool was a close competitor of wheat as a cash crop in Washington County.

The primary cause of the decline of sheep husbandry after 1840 was economic. It cost $1.00 to $2.00 a head to raise sheep in Pennsylvania as compared with twenty-five to seventy-five cents in the West. Depredations of dogs also were a factor. Not until after 1900 were there heartening signs of recovery.

HORSES

The horse was not an important farm animal in Pennsylvania until after 1790, when highway improvement began; then it supplanted the slower moving ox for hauling produce to market. Previously oxen had been preferred for general farm work; horses were kept mainly to ride over the execrable roads of that period.

Horses were brought to the New World by Columbus in 1493; by De Soto in 1538, by the Virginia colonists in 1607, by the Dutch in 1625 and by Lord Baltimore in 1634. "Wild horses" found by the first Swedish settlers on the Delaware probably had escaped from the Maryland settlements. The Swedes brought over a few pacers; most of the horses in Pennsylvania prior to 1700 were broken to pace. They were small, averaging only about thirteen hands high. In 1759 Acrelius reported, "The horses are real ponies. . . . He who has a good riding horse never employs him for draught, which is the less necessary, as journeys are for the most part made on horseback. The country excels in fast horses, so that horse races are often made for very high stakes. A good horse . . . is not to be bought for less than six hundred dollars copper coinage [about $60 present value]." [98]

Immediately prior to the coming of William Penn, when the public affairs of his grant were administered in the name of the Duke of York, a number of laws concerning horses were promulgated. In 1676 it was required, "Every Town within this Government shall have a marking Iron or flesh brand for themselves in particular to distinguish the Horses of one Town from another; besides which every Owner is to have and Mark his Horses with his own Particular flesh Brand." [99] An officer was designated in every town to register the age, color, natural marks and brands of each horse. A person who bought or sold an unbranded horse was subject to a fine of ten pounds. In another regulation every farmer was required to keep a certain number of horses for use on the farm and twice that number to run at large.

Like most Englishmen of his time, William Penn was fond of good horses. On his first visit to America, in 1682, he brought three blooded mares, a fine white horse not of full blood and several common horses to be used for labor, not for breeding. When absent from the province he made frequent inquiries about the mares. On his second visit, in 1699, he brought the magnificent colt Tamerlane, by the celebrated Godolphin Barb, to whom some of the best horses in England today trace their pedigree. While there is no authentic record, it may be assumed that the superior horses of William Penn entered largely into the improvement of horse-flesh in the province. His Secretary, James Logan, was an enthusiastic horse breeder.

In 1683 Penn wrote to friends in England, "We have no want of horses, and some are very good and shapely enough; two ships have been freighted to Barbadoes with horses and pipe-staves since my coming." [100] Two years later Thomas Budd said, "Our Horses are good, servicable horses, fit for both Draught and Saddle; the Planters will ride them fifty Miles a day without Shoes." [101] Horses were mostly unshod, even when used for heavy hauling, until after 1750.

Exportation of horses without permission from the government was forbidden by the General Assembly in 1683 under penalty of a fine of ten pounds, but it continued unabated. In 1690 Robert Rodney, speaking of trade with the West Indies, mentioned horses and noted, "A good breeding mare was sold for five pounds." [102]

In early colonial days most horses ran at large and some became wild and were hunted with dogs, as in Virginia. As late as 1737 a visiting Scot found "horses that are wild in the wilderness, that are yer ain when ye can grip them." This was true only if they were not branded. During the entire colonial period and until after 1800 rangers were appointed by county courts to enforce laws on the branding, stealing and trespassing of livestock. Stock at large which was not branded they impounded.

Horse stealing was common in spite of the efforts of rangers and the severe punishment imposed. In 1718 the English law against horse stealing, which required the death penalty, was in effect here. An Act of 1767 provided that a horse stealer must pay the Governor a sum equal to the value of the horse, receive a public whipping of not to exceed thirty-nine lashes, stand in the pillory one hour, have both ears cropped and nailed to the pillory, and be imprisoned at hard labor for six months. For the second offense he was imprisoned three years.

Even the severity of this punishment did not lessen materially the number of horse stealings. So in 1780 the Assembly increased the penalty; on second conviction, in addition to the foregoing punishment, the offender was to be "branded on the forehead in plain and visible manner with the letters H.T." [103] This barbarous penalty was seldom imposed. On November 27, 1788, John Tulley of Chester County was convicted of horse stealing and was sentenced to "stand one hour in the pillory between the hours of nine and twelve tomorrow morning, to be whipped with thirty-nine lashes on his bare back, well laid on, to have both ears cut off and nailed to the pillory and to be imprisoned for six months." [104] In 1790 the Assembly abolished punishment by pillory, whipping, branding and ear-cropping for all offenses and imposed prison sentences of up to seven years for horse stealing, in addition to restitution.

Horse stealing continued to be common throughout the province and state, especially in frontier counties where it was easy for the culprits to escape into the woods. About 1750 so many horses were stolen in Northampton County that farmers petitioned the Assembly to revive the death penalty. Farmers banded together for mutual protection against horse thieves. In 1811 an "Association for the Detection of Horse Thieves" was organized in Lancaster County. In 1832 the "Northampton Horse Insurance Company" was chartered by the Assembly. [105] In 1840 the "Lehigh Company for the Insurance of the Lives of Horses and for the Apprehension and Detection of Horse Thieves" was incorporated. [106]

Horse stealing was a prolific source of trouble in western Pennsylvania until long after 1840. Summary justice was visited upon offenders. In 1801 Micheaux related, "The plundered inhabitant . . . frequently succeeds in taking him; upon which he confines him in the county prison or, which is not uncommon, kills him on the spot . . . This severity appears influenced by the great facility the country presents for committing the crime." [107]

As a result of promiscuous breeding in the woods as well as undernourishment, colonial horses degenerated in size and stamina. Recognizing this, in 1682 the Assembly ordained, "No person in this Province or territories thereof shall . . . suffer any Stone horse to run at large after two years old, under thirteen and one half hands high, four inches to the hand; under the penalty of five pounds." [108] In 1724 the Assembly passed "An Act to Improve the Breed of Horses": "Whereas the multitude of small-sized stone-horses running at large in the woods has much degenerated the breed of good horses . . . no stone horse of above eighteen months old shall be suffered to run at large within this province unless such horse be of comely proportions . . . and full thirteen hands high." [109] Stallions not meeting these requirements were to be gelded.

THE CONESTOGA HORSE AND OTHER BREEDS

There was little improvement of type until about 1750. It was natural that the first great horse of American origin should be developed by Pennsylvania Germans. From the first settlements they had taken good care of their livestock, in breeding as well as in feeding. In the valley of the Conestoga River, Lancaster County, was developed a horse that made history. For nearly a century it was generally acknowledged to be the most efficient draft horse in America. Hitched to great, canvas-topped Conestoga wagons—"the ships of inland commerce," as Dr. Benjamin Rush called them, they moved the heavy tonnage of farm produce of Lancaster, York and adjacent counties to the Philadelphia market. They dominated the wagon routes of Pennsylvania from 1750 to 1840, when railroads began to supplant wagoning. Conestoga horses carried pioneers across the Alleghenies over tortuous mountain roads. No other horse was so intimately associated with the early development of Pennsylvania agriculture and commercial transportation.

The Conestoga was a general type, not a definite breed in the sense that it had characteristics that had become fixed by inbreeding over a long period. One of the earliest descriptions is by Patrick M'Robert, in 1775: "Their horses are very neat, round punches, generally between fourteen and fifteen hands high, very mettled; six of them make a very pretty team; many of them are to be seen in this city [Philadelphia] every day in waggons loaded from the country with wheat &c." [110]

A more detailed description is given by W. J. Kennedy: "The Conestoga horse had no growth of long hair or feathers between the knee and fetlock, as this would have been an unending source of trouble to the driver on muddy roads; a long tail also was a nuisance. The feet were moderately large but not flat, the top of the neck or crest well arched, body and legs rather short, temperament docile rather than nervous, movement forward steady and not wabbling, height to withers sixteen to seventeen hands and weight 1800 pounds or over in normal condition. The best colors in order were bay, black, gray, brown, chestnut, sorrel, roan, with not too much marking." J. E. Wright describes them as "handsome, active animals, with great powers of endurance, short legs, arched necks and full manes. Although their stride was short, it was sturdy and safe in descending long mountains." [111]

The origin of the Conestoga is in doubt. John Omwake suggests that it may have been the blood of a Flemish stallion brought over by William Penn, since it had many of the characteristics of the Belgian—short arched neck, full mane, stout legs. [112] The early English settlers on the Delaware secured a number of Flemish horses from the older colony of New Netherland; it is possible that the Conestoga was a descendent of this stock and was secured by German pioneers from English settlements near Philadelphia.

In 1856 John Strohm of New Providence, Lancaster County, who was reared in the Conestoga Valley, made this statement: "The Valley of the Conestoga was originally settled by Germans who took a great deal of pride in keeping fine, large, fat horses . . . This region became noted in producing the finest teams in the country, but there was not, I think, any distinctive original stock to which the application of 'Conestoga' could with propriety be applied.

"Some sixty or seventy years ago a horse was introduced into the county called the 'Chester County Lion,' and a great many horses have been raised from that stock. About the same time or perhaps a little later another was brought here called the 'English Ball,' a large, heavy, clumsy horse, probably of Flemish stock . . . There have been, also, several blooded English horses brought into the Conestoga Valley which, being crossed on other breeds, have produced some very fine, active, serviceable horses. All these have been considered Conestoga horses."[113] On another occasion he remarked, "It is quite probable that the first immigrants in this valley derived their stock of horses from their nearest neighbors in Chester County and the vicinity of Philadelphia. Being well fed, comfortably stabled and never over-worked, this horse attained the full development of his natural powers, much surpassing the original stock."[114]

The Conestoga horse, as such, has long since ceased to tread the Lancaster Pike; it is regrettable that the type was not perpetuated. It is a symbol of the transition period in Pennsylvania agriculture—between the pack-horse train and the railroad; between subsistence farming and commercial farming. So proud were the drivers of Conestoga teams that they bedecked their horses with gaudily fringed woolen housings and festooned the hames with red trimmings. Over the hames of each horse was a graceful arch of four or five well-toned bells of iron, bronze or brass. The horses, as well as their drivers, "felt their oats." Said Benjamin Rush, "A German horse is known in every part of the state; indeed he seems to feel, with his lord, the pleasure and pride of his extraordinary size and fat."

Mettlesome six-horse Conestoga teams, decked in full regalia, bells chiming musically, necks arched in conscious pride, pulling gaily-painted Conestoga wagons, were a sight to brighten the eyes and quicken the pulse. We pay tribute to them today as trucks whiz past at fifty miles an hour.

Conestogas held almost undisputed sway on Pennsylvania highways until after 1840 when Percherons began to replace them. The first importation was in 1839 when Edward Harris of Moorestown, New Jersey, brought over the stallion "Dilligence." He and his get made a marked impression on the farm horses of Pennsylvania and New Jersey. Not until after 1851, however, when the famous Percheron stallion "Louis Napoleon" was imported by Charles Fullerton of Ohio, did this breed become prominent in Pennsylvania.

Prior to 1840 mules were not popular in Pennsylvania, but they became the premier draft animal of the South. George Washington was responsible for popularizing this hybrid in the South; most of the mules in America are descended from one jack and two jennies which LaFayette and the King of Spain gave him in 1785.

Much less attention was given to breeding trotting and driving horses in Pennsylvania than in Virginia and other southern states. Trotting horses were scarcely known here when "Messenger," a thoroughbred stallion, was brought to Philadelphia from England in 1788. From him have descended many of the best trotting horses of the country. Thoroughbreds were tall, light and nervous—too nervous for use on the farm but well suited for the saddle, carriage and race course.

"Messenger" met a cool reception here. The Pennsylvania legislature passed a law prohibiting horse racing; this restriction continued until after 1813. In that year Governor Snyder, in a message to the General Assembly, recommended that horses bought for racing be confiscated. The first progeny of "Messenger," therefore, were trained for the road rather than for the track. "Messenger" was taken to New York in 1793. By 1825 trotting courses and horse clubs were firmly established in all the larger cities; one of the most noted was Hunting Park Course in Philadelphia. In 1833 the Committee on Agriculture of the House considered sympathetically a petition that a law be passed to improve the breed of horses by testing their speed and bottom by means of legalized racing.[115] Another milestone in horse breeding was the birth of the great "Justine Morgan" in 1793, sire of the famous Morgan family. The Morgans were unexcelled as roadsters and were used as general purpose horses on many Pennsylvania farms.

From 1790 to 1830 horses as well as cattle were driven from western Pennsylvania and beyond the Ohio to Philadelphia and Baltimore. "The horse drover," said William Schell, "would generally have about thirty horses; sometimes these were tied to a long cable, one on each side, but mostly six horses were abreast, tied to each other, with a rider on one of them . . . I have often seen two droves of horses . . . passing through Bedford in a single day. They were driven twenty to twenty-five miles in a day."[116]

During the period of heavy migration westward Pittsburgh was a cheap market for horses. "Travellers from the East," said Morris Birbeck, "often quit their horses here and take to the river. . . . The mode of selling is by auction. The auctioneer rides the animal through the streets, proclaiming with a loud voice the biddings that are made as he passes along; and when they reach the desired point, or when nobody bids more, he closes the bargain."[117]

By 1840 horses had displaced oxen on Pennsylvania farms except in mountainous districts. This displacement had been going on since 1750. In 1788 a farmer wrote, "Formerly it was the custom to plough and harrow the lands as well as convey their produce to market by means of oxen. That frugal means of land carriage is at this time almost wholly discontinued; and such is the force of custom and prejudice that I know many persons who would sooner carry their articles to market on their shoulders than to be seen driving an ox team."[118] The development of turnpikes, beginning about 1790, hastened the downfall of the slow-moving oxen as a means of transportation, but they persisted for half a century thereafter on hill farms. With the advent of canals, about 1820, the number of draft horses increased rapidly. The building of railroads, after 1830, displaced many horses but the decline was only temporary. Horse-drawn farm machinery, especially mowers, hay-rakes and cultivators, began to appear. By 1840 horses were the main motive power on Pennsylvania farms.

POULTRY

Poultry was a comparatively insignificant feature of Pennsylvania agriculture until after 1840. In colonial days every farmer kept a few "dung-hill fowls" for family use and geese to pluck for making feather beds and pillows; possibly a few ducks also. Wild turkeys were abundant but a few domesticated turkeys strutted in the barnyards. Any surplus of meat or eggs beyond the needs of the family was disposed of to customers in town or bartered at the country store.

Chickens were brought to the West Indies by Columbus in 1493 and by the English to Jamestown in 1607. Being easy to transport and feed they formed part of the cargo of every expedition to the New World, including the Dutch, Swedes, English and Germans who settled in Pennsylvania. Often chickens shared the dwellings of the Swedes, a custom that had prevailed in Sweden and Finland for centuries. The cock was their morning alarm clock. In 1683, according to Thomas Paschall, there was "great store of poultry" in the province.

Not until after the Revolution, when Philadelphia began to reach out into the country for fresh produce, was there much interest in poultry production as a commercial enterprise. In 1794 Cazenove related, "The smallness of grain crops since the Hessian Fly came causes all the Chester County farmers to attend to poultry raising, making butter . . . and raising cattle for the Philadelphia market."[119]

The low state of poultry husbandry in 1809 is evidenced by the statement of Richard Peters: "A farm homestead is enlivened by poultry and family comforts are much increased by their eggs and young. But their numbers should be kept within bounds. . . . Turkeys are the most mischievous and offensive, and geese are predatory trespassers . . . Dung-hill fowls of innocent breeds are preferable to either . . . High feeding is not promotive of but checks fecundity. Confining them too much has not been found eligible. It is necessary and desirable for them to seek for and destroy insects and other pests of your gardens and fields."[120] The "innocent breeds" he referred to were, in fact, innocent of any breeding; at that time chickens were a mongrel lot of assorted sizes, colors and degrees of inefficiency in meat and egg production, but averaging very low in both.

During the hey-day of the drover, 1790 to 1830, large flocks of domesticated turkeys were driven to Philadelphia from the "back country." This method of transportation had been used in Europe for centuries. Julius F. Sachse gives this account of turkey driving on the Lancaster Pike: "One of the curious sights common in the fall of the year were flocks or armies of fowls, generally turkeys, but now and then geese, being driven toward the city. This was not an easy task. They were apt to crowd together and trample each other to death. To prevent this they were divided into lots of 50-75 with a 'shooer' in charge of each lot. He had a long pole with a piece of red flannel fastened to the end. The best time made on the road was not much over a mile an hour.

"As soon as it commenced to grow dark the fun began. The birds were determined to go to roost and notwithstanding all the efforts of the drivers they generally did. The stampede usually took place in passing an orchard or grove of trees. In much less time than it takes to tell it the trees were black with birds and the day's journey was ended for the turkeys. Not so for the drivers, who had to watch the birds all night to prevent theft." [121]

The first wave of enthusiasm for poultry production passed over Pennsylvania between 1850 and 1855; it swept many an urban amateur off his feet. A contemporary farm paper, viewing the scene, burst into derisive song:

Lawyers and doctors and divines,
All their practice have resigned;
And to improve the breed of hens
All their talents have combined.

Prices of breeding stock, especially imported fowls, soared sky-high. Few practical farmers were afflicted with this "hen fever," which soon ran its course. Some permanent improvement in chickens resulted, but there was little real progress in commercial poultry husbandry until after 1880.

IX

HORTICULTURE

HORTICULTURE was a comparatively minor aspect of colonial agriculture. Fruits, vegetables, flowers and ornamental trees and shrubs, while eminently desirable, were not as essential to the pioneer family as bread and meat, since a considerable supply of fruit could be secured from the wild. Horticulture is the last of the specialized phases of agriculture to be developed commercially in a new country; it is a refinement that is dependent on a high degree of civilization.

FRUIT GROWING IN COLONIAL DAYS [1]

Until after the Revolution horticulture centered almost wholly around the home; it was part of self-sufficing farming. Practically every farm had an orchard, a vegetable garden and a few flowers and ornamentals. With the growth of cities and towns there developed a strong amateur interest in horticulture by well-to-do urban dwellers; it was a hobby which they pursued with great enthusiasm.

Philadelphia was the center of amateur interest in horticulture in America. This led to the organization of the Pennsylvania Horticultural Society in 1829, the first such society in America that has endured; the society organized in New York in 1818 fell by the wayside in 1837. Commercial horticulture did not develop to any considerable extent until after 1830, coincident with the growth of cities and towns. It became localized not only with reference to markets but also with reference to climate, soil and other environmental factors. Fruit growing was by far the most important phase of colonial horticulture, mainly because fruits could be converted into "comfortable drinks."

The paucity of native grains and grasses in the New World was partially offset by the wealth of native fruits, mostly small fruits. The early Dutch and Swedes gave these scant attention; the English and Germans were more appreciative. "The Fruits that I find in the Woods," wrote William Penn, in 1683, "are the White and Black Mulberry, Chestnut, Wallnut, Plumbs, Strawberries, Cranberries, Hurtleberries and Grapes of divers sorts. . . . Here are also Peaches and very good and in great quantities, not an Indian Plantation without them; but whether naturally here at first I know not, however one may have them by Bushels for little; they make a pleasant Drink." [2]

This inventory of native fruits was supplemented by Thomas Budd two years later: "Blackberries, Medlers, Hickory-Nuts and Hasselnuts." To these should be added, in southern counties, the persimmon, crab-apple and paw-paw. None of the early writers mentioned raspberries, black and red, which were a grateful addition to the limited fare of the pioneers.

Small fruits were plentiful in abandoned clearings. Wild strawberries carpeted the ground in burnt over areas and were more than sufficient to meet the needs of settlers until long after the Revolution. In 1808 Richard Peters mentioned "a tract in Northampton County, as I was informed by ancient peoples in its vicinity, where strawberries were thrown up in most extraordinary profusion after the combustion of the pine timber, so as to cover a very great proportion of this tract (which contained nearly 800 acres). The people of the towns and others from a distance of more than twenty miles were accustomed to gather and carry off these strawberries in quantities almost incredible." [3]

Strawberries, raspberries, blackberries, gooseberries, mulberries, plums and grapes were gathered in season and dried for winter use. The profusion of native grapes of fair quality was a matter of congratulation at first but the colonists were disappointed in their wine-making properties. The early records mention plums about as frequently as grapes. Native plums of several species were valued by the Indians but were much inferior to European varieties. There were no very edible native species of apple or cherry and none whatever of pear, apricot and quince; these were introduced from Europe.

One wild tree fruit, however, was a constant source of pleasure to the housewife and her hungry menfolks. The region about Philadelphia was bountifully supplied with wild peaches. The peach was not native, as John Bartram at first surmised, but was a legacy of Spain. When Spanish adventurers under Menendez founded St. Augustine, Florida in 1565, they planted peaches. Creek, Choctaw, Cherokee and other southern Indian tribes quickly disseminated them throughout the South; by interchange with friendly tribes they soon were naturalized as far north as Philadelphia and as far west as Arkansas. The Lenni-Lenape

Indians on the Delaware grew peaches long before white men settled there. One particularly hardy type known as "Indian" peach was grown by whites for many years.

So freely did peaches grow in the Delaware River basin that in 1683 Thomas Paschall asserted, "Here are peaches in abundance, of three sorts. I have seen them rott on the ground and the Hogs eate them."[4] A generation later Acrelius found that "many have peach orchards, chiefly for the purpose of feeding their swine."[5]

Before white occupation of Pennsylvania Indians cultivated no fruits except the peach; the wild supply was adequate for a native population which has been estimated at about 15,000. They gathered wild plums, grapes, raspberries, blackberries, dewberries, cranberries, gooseberries, huckleberries and peaches and dried them for winter use, spreading them on mats in the sun. They also preserved fruits with syrup or honey. Strawberries were crushed in a mortar and the pulp mixed with corn meal to make strawberry bread.

Indians secured seeds of European tree fruits introduced by the colonists, especially apple, and planted them near their villages. Traders and missionaries carried fruit seeds to Indian villages far from white settlements. Indians often made long trips to visit friendly tribes and exchange articles of food; in this way peaches were disseminated throughout the South and East. Many early American varieties of apples were seedling trees planted by Indians.

One of the most famous Indian fruits was the Townsend apple tree in Bucks County, on the farm of Richard Townsend who came over with William Penn. He was informed by Indians of a "great apple tree," and went to see it. He found "an apple tree in an Indian clearing, vastly larger than any seen in England, heavily loaded with larger and better apples than he had ever seen before." Townsend bought from the Indians the land on which this tree stood; they would not sell the tree itself but stipulated that it was to be reserved "for the free use of all who wanted apples," a condition which the Townsend family faithfully observed. In 1760 the Townsend apple tree was four feet in diameter.[6] The fruit was large, red-striped, sub-acid.

"I well remember as a boy," said Samuel Preston of Stockport in 1828, "hearing a company of better-informed old men . . . say that according to the growth of trees that apple tree must be much older than Columbus."[7] This was impossible but undoubtedly it was considerably over a century old. Probably it came from seed secured by Indians from early European settlements in New York, possibly through Dutch colonists at Minnesinck. The Townsend apple tree died about 1792.

Orchards for home use were planted on nearly every pioneer farm. This was necessary because no very edible tree fruits were found except the peach and that was not common north and west of Philadelphia. The trees yielded bountifully at first under almost complete neglect; insect and disease control was not a serious problem. "There are great inclinations to Planting Orchards," wrote William Penn in 1685, "which are easily raised and some brought to perfection. A brave Orchard and Nursery have I planted; they thrive mightily and Fruit the first year." Such precocious fruiting of tree fruits was indeed remarkable; possibly the good Quaker stretched the point a trifle, unless he planted aged nursery stock.

In 1685 the founding of a colonial farm home was thus described: "They first fix upon the spot where they intend to build the house, and before they begin it, get ready a field for an orchard, planting it immediately with apples chiefly, and some pears, cherries and peaches. This they secure by an enclosure."

Peter Kalm, who visited New Sweden in 1748, had this to say about colonial fruit growing: "Every countryman, even a common peasant, has commonly an orchard near his house in which all sorts of fruits, such as peaches, were now almost ripe. . . . The trees were covered with such quantities of fruit that we could scarcely walk in the orchard without treading upon the peaches that had fallen off, many of which were left on the ground. Only a part of them was sold in town and the rest was consumed by the family and strangers, for everyone that passed by was at liberty to go into the orchard and gather as many of them as he wanted. Nay, this fine fruit was frequently given to the swine . . . The orchards have seldom other fruit than apples and peaches. Pear trees are scarce. Cherry trees are commonly by the sides of the roads leading to the house or along the fences." [8]

Israel Acrelius, who visited the Swedish settlements along the Delaware in 1759, regarded orchards as "among the highest advantages of the country. Peach trees stand within an enclosure by themselves and grow even in the stoniest places without culture. . . . For apple orchards, not less than two or three acres are taken; some have five or six."

Another view of fruit growing about 1753 is given by Lewis Evans: "We have great variety of Apples for the Table and the Cellar. The Newtown Pippin exceeds everything for fine taste and Duration. . . . We have lately introduced a high, red-colored Apple of good Gust, called the Spitzenberg. . . . The House apple and the Vandeveers are most esteemed for Cyder. Some few have the Golden Russetting and Golden Pippin, but not plenty. Every Body has an Orchard and makes commonly Cyder enough, but so much worm eaten and rotten Apples are used that it is often nauseous. . . . We have all sorts of Cherries in perfection. We adorn our Avenues with Black Heart cherries. Peaches are of two species, the Cling Stones and Clear Stones, the former in most esteem. . . . They are both so common as to be the Summer food of the Hogs. . . . Pears in great perfection, but not so common as Apples, Cherries or Peaches. . . . Plumbs are grown in vain unless close to a smoaking Chimney."[9] He adds that wild strawberries were in such great plenty that "very few are curious of cultivating them" and that grapes, raspberries, blackberries, currants and gooseberries were rarely grown.

Most of the trees in early colonial orchards were seedlings, or "common" fruit, to distinguish them from grafted trees of named varieties. The "crafte of graftyage, alternyage and plantynage" had been known for centuries but was not commonly practiced here. The colonists imported fruit from Europe mainly as seeds, since grafted or "inoculated" nursey stock was very costly and had little chance of surviving the long sea voyage. A few named varieties, especially of apples, were recognized; these were propagated by grafting.

The apple was "King of Fruits" in colonial Pennsylvania and for many decades thereafter. Practically every farm had an apple orchard of one to six acres. Some of the fruit was eaten fresh, dried or stored for winter use and fed to livestock but most of it was converted into cider. In 1791 a Bucks County farmer reported to George Washington, "Every farm has more or less orcharding; an average of eight acres is allowed for that use, the product thereof in apples and cider cannot be worth less than thirty dollars." This statement is sufficient commentary on the low estate of orcharding at that time.

Some large orchards were planted for cider-making. In 1698 Gabriel Thomas mentioned "A famous Orchard adjoining to it [the Neshaminy River, Bucks County] wherein are contained alone a Thousand Apple Trees of various sorts."[10]

Apples as well as peaches were used as hog food. As late as 1862 a prominent fruit grower recommended more extensive planting of apples "because pork is cheap and it is necessary that cheap feed be used in making it." Sweet varieties were grown much more commonly than at present, "to please the hogs." We can but admire the discriminating taste of the hogs of that period in the choice of varieties: "A hog is naturally an epicure; when left to himself he is a good judge of what is best. He never eats a sour apple unless forced to it by hunger. He will go over the orchard and pick out the choicest fruit, always choosing that which is in such a state of ripeness that its qualities are nearest perfection. Watch the hogs and you will know what varieties to plant." This shifting of responsibility for the choice of varieties from the fruit grower to the hog has fallen into disfavor in recent years!

As the pioneers moved westward and northward they took apple seeds with them and established home orchards. According to Henry B. Plumb, "Every farm in the Wyoming Valley had an orchard. It was generally planted in the first field cleared, perhaps because other crops could be raised in the same field while the trees were growing. It took ten years to produce a crop of apples from the time of planting the seed. Young apple trees could be bought for sixpence each."[11]

From 1800 to 1840 an eccentric character, John Chapman, commonly known as "Johnny Apple-Seed," helped to populate the more remote districts of western Pennsylvania with seedling apple trees. He procured seed from the older farming districts and went from place to place on the frontier, carrying it in his saddlebags, and sowed it in clearings. These little nurseries were protected with brush fences. Most of the seedling trees resulting from this labor of love he gave away; they were a source of much pleasure to early settlers. Some of the best of named varieties of later years originated from seeds planted by Johnny Apple-Seed. His contribution to the horticulture of prairie states, especially Ohio and Indiana, was much larger than it was in Pennsylvania.

Every farmer had more apples than he could use; often a large quantity rotted beneath the trees. Passers-by could help themselves liberally. This was not considered stealing until after the commercial industry began to develop. "Mankind never will look upon taking fruit in an orchard or garden as felony nor even as tresspass," said William Cobbett in 1819. Not many years later, however, robbery of orchards was punishable by a fine of "three times the value of the fruit stolen, and a public whipping of not to exceed 21 stripes, well laid on."

Benjamin Franklin made notable contributions to horticulture. His interest in it was not only that of a scientist but also of a statesman, for agriculture was the foundation of the national wealth. In February 1759 Peter Collinson, an English naturalist, wrote to John Bartram, "Our Friend Benjamin had a fine parcel of apples come over this year, which I shared." These were Newtown Pippins. They whetted the appetite of Collinson and other Englishmen for American apples and brought to John Bartram an order for scions of that variety. Franklin distributed specimens of Newtown Pippins at the British Royal Court where they were received with such favor that a brisk export trade developed. In 1773 Michael Collinson, son of Peter, wrote to John Bartram, "Your American apples have been an admirable substitute this season, many of our merchants having imported great quantities of them; they sold for two to four pence each."[12] From this small beginning sprang the American export trade in apples which, in later years, absorbed more than ten per cent of the commercial crop of the nation; it was an important market outlet for Pennsylvania apples.

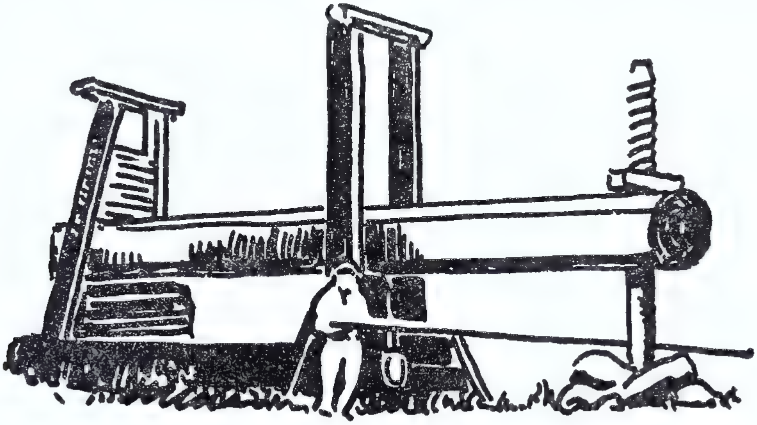
"COMFORTABLE DRINKS"

Tree fruits were grown primarily to drink, frequently to feed to hogs and only incidentally to eat. Our colonial forebears were prodigious drinkers of a great variety of liquors, fermented and distilled. They viewed water, for drinking purposes, with deep suspicion if not aversion. This was partly because poor sanitation often rendered water unsafe to drink but mainly because Old World customs of many generations prevailed here.

Much of the advertising of the New World in Europe designed to attract settlers featured its advantages for the production of wine, cider and brandy. All the colonies had laws restricting the price of liquors so that they might be within the means of even the poor. We have the word of Captain John Smith, speaking of Virginia, that "few of the upper planters drink any water"; they preferred "most excellent and comfortable drinks." This statement could be applied equally well to Pennsylvania colonists.

The citizenry was by no means as democratic then as it is now; Old World class distinctions were transferred to America and flourished here until after the Revolution. The "upper classes" drank imported wine. The "middle classes" drank cider, perry (pear cider), peach brandy, peach vinegar (a sort of cider), and other home-made fermented fruit juices. A still lower stratum of society slaked its perennial thirst with rum and a potent liquor called apple jack. Most farmers preferred apple cider. This was thought not to be really "prime" until it was two or three years old. If the supply of cultivated fruits was inadequate to fill barrels and casks, native fruits—plums, cherries, grapes, elderberries and others—were drawn upon to make "good spirits."

Conversion of fruit into liquor began as soon as the first orchards yielded their increase. In 1683 Thomas Paschall reported, "Peaches, as well as wild plums, cherries and grapes, are distilled for brandy, and most people have stills of copper for that use." In 1698 Gabriel Thomas spoke enthusiastically about the "large and pleasant Fruit, of which most excellent Cyder is made . . . sold commonly for between Ten and Fifteen shillings per Barrel. Pears, Peaches etc. of which they



An early cider mill—about 1820—in Northumberland County.

distilled a Liquor much like the taste of Rumm or Brandy, which they yearly make in great quantities."[13]

So dependent were farmers on cider that most of the farms advertised for sale in the *Pennsylvania Gazette* about 1760 mentioned orchards and the number of barrels of cider which could be expected from each. The requirements of a family were from ten to fifty barrels annually. In almost every farm home a barrel of hard cider was constantly on tap. Foaming pitchers were brought to the table at every meal. When milk was scarce small children drank diluted cider.

There were some large orchards for commercial cider-making. The possible profits of this enterprise were stated by Thomas Cooper in 1793: "The orchard of Mr. M'Allister at Paxtang contained 1600 apple trees planted 33 feet apart. If 1794 should be a good year he expects to make 1000 barrels of cyder. He supposes his trees to yield ten bushels of apples on the average . . . Cyder usually sells at 10 s. and 12 s. per barrel of 31½ gallons."[14] Beside domestic consumption, there was a brisk export outlet for cider and cider brandy, particularly in the West Indies.

Prior to 1740 cider commonly was made for home use by pounding the apples with a "stamper" in a trough or strong wooden vessel, then placing the pomace in a large splint basket to drain. Sometimes the fruit was placed in a trough cut out of solid rock and the juice crushed out by rolling a heavy log or rounded stone over it. John Bartram had such a cider press.

Cider mills were introduced about 1745. These were of several types. A crude mill used in Montour County about 1810 is described by D. H. B. Brower: "The mill was composed of a wooden wheel six feet in diameter and a foot thick, with a shaft through the center, the wheel revolving in a circle or groove. In this groove the apples were placed and by applying horse power to the shaft the wheel passed over and crushed them to pomace. This was then placed in a press of rude construction and the cider expressed from it."[15]

Beginning about 1720 large numbers of Scotch-Irish came to the colony bringing with them a preference for more ardent spirits than that made from fruits. They turned to the distillation of whiskey from rye and corn. By 1780 this fiery liquor had begun to supersede fruit beverages in popular esteem. Until after 1830, however, farmers continued to haul "wagon loads of apples and peaches to distilleries to be made into liquor,"[16] and farm cellars were full of cider barrels.

About 1830 a vigorous temperance movement swept the state; it made many converts among farmers. "Many worthy men," said the editor of *Farmers' Cabinet* in 1837, "have resisted the march of the temperance cause because they would have to sacrifice their orchards. Others, in their zeal to do away with the evils of excessive drinking, have actually cut down their trees." The centuries-old controversy between the "wets" and the "drys" seems to have been conducted with fully as much heat and mutual intolerance then as it is today. Witness this damning indictment: "Cider drinkers are the most brutish and cruel of all the unhappy tribe of inebriates. They also are peculiarly subject to rheumatism, inflamed eyelids, headaches, bleeding at the nose, sores and ulcers, affections of the stomach and bowels, and premature trembling of the hand and head." [17]

The temperance movement, together with the development of more markets for fresh fruit about that time, marked the end of the period when fruit was grown mainly to make "comfortable drinks." Says U. P. Hedrick, "Fruit growing in America had its beginning and for 200 years almost its sole sustenance in the demand for strong drink."

Before the art of canning was known fruits, especially apples and peaches, were preserved for winter use by drying. "In the autumn," says S. A. Beach, "the kitchen fireplace or stove usually was surrounded by festoons of quartered fruit which had been patiently strung on tow strings; or the fruit was spread on racks above or on paper beneath the stove." The Pennsylvania German *hausfrau* prepared great quantities of *schnitzen* for making dried apple pies.

After 1800 dry-houses became common. "No farm with an orchard," says T. S. Davis, "was likely to be without a dry-house. This was a small building with a wood-burning stove placed in the middle, with a number of long drawers on each side of it in which the fruit was placed and there dried. Apples, peaches and plums were dried in this way. . . . People who did not have dry-houses dried fruit in the sun, and a still more primitive way was to dry by the kitchen fireplace or chimney corner. . . . Long strings of luscious-looking peaches, cut in halves, and strung on stout cords were hung on each side of the chimney corner, with a subdued fire, perhaps live coals in the middle." [18]

Commercial canning of fruits, patent for which was granted in 1825, did not begin to attract attention until after 1840; not until 1870 was it firmly established as an adjunct to the fruit industry.

Colonial orchards of all kinds of fruits were almost universally kept in sod, but during the first few years the land might be cropped with corn and small grain. The grass was cut for hay or pastured. Every six or seven years the sod might be broken and the orchard cropped with grain for a few years before being again laid down in grass.

The publication by William Coxe of Burlington, New Jersey, of his *View of the Cultivation of Fruit Trees,* in 1817, quickened interest in tillage of orchards. Previously Coxe had presented his views before the Philadelphia Society for Promoting Agriculture. His experiments led him to the conclusion, "I think they prove the utility of cultivation to the growth of the orchard." [19] This view was stoutly controverted by other horticulturists, including Richard Peters who reflected the majority opinion of his time when he said, "I have my doubts whether enriching and constantly cultivating an old orchard will be found advantageous. Occasionally plowing is serviceable to promote the health of the trees, but manuring and loosening the soil too much, I fear, will cause them to over-bear." [20] This point of view prevailed until after 1860 when tillage of orchards, especially peaches, began to find adherents.

The great Philadelphia horticulturist, Thomas Meehan, was far ahead of his time when he said, in 1843, "Another cause of unfruitfulness in apple orchards is to suffer grass crops to grow in the orchard for more than two or three seasons without breaking up the sod. As a general rule, after planting an apple orchard keep the ground for the first years in some cultivated crop; after that if grass crops are grown in it, three seasons at the most should not pass without plowing the sod." [21] This is the "sod rotation" or "temporary sod" practice of today, rediscovered after the lapse of a century.

The "natural method" of pruning was practiced by most fruit growers. As Cyrus Fox of Reading put it as late as 1886, "Never learn to prune and never prune. I have yet to see an orchard that has been benefited by the application of the knife." In order to keep fruit out of reach of livestock pastured in the orchard it was recommended, "The head of every apple tree should begin at least six feet from the ground; and of those whose branches are sloping, eight feet."

Confirmation of the adage, "There is nothing new under the sun," is derived from perusal of numerous comments between 1800 and 1825 on girdling, ringing and "circumcising" fruit trees. Then, as now, it was found advantageous to merely score or ring the tree rather than to remove the bark. [22]

Insect pests and diseases were far less virulent in colonial orchards than at present, but what there were held practically undisputed sway. "Faulty" fruit was accepted as natural and inevitable. There was little knowledge of the life history of pests as a guide to methods of control. The statement of John Josselyn of Massachusetts in 1671 was equally applicable to Pennsylvania: "Theer fruit trees are subject to two diseases, the Meazles, which is when they are burned and scortched with the Sun; and lowsiness, when the Woodpeckers jab holes in theer bark; the way to cure them when they are lowsie is to bore a hole in the main Roote with an Augur and pour in a quantity of Brandie or Rhum and then stop it up with a pin made of the same Tree."

Little progress was made in insect and disease control until after 1887. In 1806 Richard Peters complained that fruit trees near Philadelphia were "more subject to mortifying decay, disease and destruction" than when he was a boy; but he had observed that fruit grew in greater perfection "in and about Lancaster and other parts where limestone and other calcareous substances abound." He attributed the recent marked increase in pests and diseases to "some change in our climate, some morbid infection of the air, and new races of vermin not known to our ancestors. Pears are liable to blight from the electric fluid. Iron hoops and old horse shoes hung on the trees attract and conduct for a time this floating fluid. But when the air is surcharged, partial or total destruction is certain. Cherries are fatally operated on by the four o'clock sun."[23] This from one of the most outstanding fruit growers of his time!

Judge Peters fully vindicated his reputation as a horticulturist, however, in his counsel on the treatment of peach yellows. About the year 1800 peach growers in the vicinity of Philadelphia began to complain bitterly of a disease which caused the trees to die after a few crops had been harvested. This was the Yellows. It was first described by Judge Peters in 1806: "I attribute its origin to some morbid infection of the air. . . . After my general defeat and most complete overthrow, I recruited my peaches from distant nurseries . . . I have since experienced a few instances of this malady and have promptly, on the first symptoms appearing, removed the subjects of it, deeming their cases desperate in themselves and tending to the otherwise inevitable destruction of others . . . This disease I call the Yellows."[24]

All authorities recommended pasturing hogs in orchards as one of the best means of destroying insect pests. Many vile-smelling washes were used freely on the trunks, scaffold limbs and crowns of trees on the theory, perhaps, that if a man could not stand it to be near them an insect certainly could not. Tar, turpentine, tobacco, snuff, sulphur, camphor, urine and rabbit's blood entered into the composition of these odoriferous repellants. Bernard M'Mahon, a noted Philadelphia horticulturist, cautioned against leaving "descending roots" on fruit trees since "there is not a more powerful agent for producing the canker and other disorders than descending roots."

Discoursing on plum "curculiones," M'Mahon gave this sage advice: "General Robinson of Naaman's Creek (Delaware County) suspends four or five bits of boards about the size of a case knife, dipped in tar, in each of his plum trees from about the time the trees are in full bloom until the fruit is ripe, renewing the application frequently. To this expedient he attributes his never-failing success."

An heroic method of disease control was advocated by Samuel Preston of Philadelphia in 1811: "A very intelligent gentleman from near Boston informed me that he had discovered the true cause of the bitter rot of apples—a certain kind of worm between the wood and the bark; and that a safe and easy mode to prevent it was to peel all the bark off the body of the trees on the longest day of the year, which he said he had frequently done; that it did not kill or injure the trees but that they grew much better for it and that it effectually prevented bitter rot."[25]

Not until after the organization of state agricultural experiment stations, in 1887, was there any material addition to knowledge of the life history of insect pests and plant diseases, which is basic to the development of effective control measures by spraying and other means. Previously there was little or no scientific approach to the problem. No public agencies were engaged in this study. The only recourse was to enlist the cooperative effort of fruit growers. "Representations from various quarters having been made to the Pennsylvania Horticultural Society of the extensive and increasing ravages of insects upon the fruits of our country . . . the Society requests all interested persons to subscribe funds for the purpose of offering suitable award for the discovery of an antidote to the evil. . . . It is proposed that two thousand dollars be raised for this object."[26] Truly a modest sum for the accomplishment of such a comprehensive objective!

Beginning of Commercial Fruit Growing

After the Revolution the urban population of Pennsylvania increased rapidly, thus providing potential markets for fruit. In 1790 Philadelphia was a city of 55,000, the largest and most wealthy in the young republic. It began to reach farther and farther afield for supplies of fresh fruit, mainly to districts that could be reached by water transportation, such as west New Jersey, Delaware, the Chesapeake bay region, and parts of Pennsylvania bordering the Delaware and Schuylkill.

Centers of interest in fruit growing other than near Philadelphia began to develop. Timothy Matlack, who lived "on the summit of the hill on which the Borough of Lancaster stands" had more than a local reputation. His treatise on "Cyder Making" found wide acceptance.[27] While there was some production of fresh fruit for market, the "comfortable drink" motive still dominated Pennsylvania fruit growing. This is evidenced by the premium list of a fair, held by the Pennsylvania Agricultural Society at Paoli, October 1823. No premiums were offered for fresh fruit, but $10 was awarded "for the best barrel of cider."

The first milestone on the road to commercial fruit growing as known today was the more general practice of the ancient art of grafting. Fruit from seedling trees of colonial orchards was variable as to type and unpredictable as to yield. Little progress could be made until there were nurseries for the propagation and dissemination of superior varieties.

Small nurseries of seedling trees were established in Pennsylvania long before the founding of the first large commercial nursery in America, that of William Prince on Long Island, about 1750. "Many people make a living by planting fruit trees and selling the young trees," said Christopher Sauer of Germantown in 1724, "so that when somebody chooses a farm he may at once have fruit trees and plant them and gather from them the first year. But if one sows seeds himself he may have fruit from them in five years."[28] About 1750 Christian Leman established a small nursery of "inoculated" trees at Germantown. The seed house of David Landreth and Son of Philadelphia, founded in 1784—the first seed house in America—had a fruit tree nursery near what is now Market Street. The Landreth collection of fruits was quite extensive.

Most of the grafted fruit trees planted in Pennsylvania between 1750 and 1820 came from the Prince and Landreth nurseries and from the nursery of William Coxe of Burlington, New Jersey, which was established in 1806. The advantages of grafted trees, however, were not generally recognized until about 1820.

After 1800 a few nurseries of grafted trees were established in the western part of the state. In the Washington *Reporter* for March 20, 1809, Daniel Gregg advertises for sale at his Washington County nursery two to four year old apple trees, "the grafts having been selected from some of the best nurseries in Chester and Bucks counties," of the following kinds: "Romanites, Red Vandevers, Green do., Winesaps, Pennocks, Newtown Pippins, Green do., Hughes Crab, Green Apples, June Apples, Ashmore's Early Red Streaks, and sundry other kinds of summer fruit."

After 1800 named varieties propagated by grafting or budding gradually supplanted seedling trees. Some were superior sorts that had been growing in seedling orchards. Most of these early varieties served their time and dropped out of cultivation when better sorts were introduced, but a few survive to this day. Witness this list of old-time apple favories described by M'Mahon in 1806 and by Coxe in 1817:

Dominie
Early Harvest
Esopus Spitzenberg
Fall Pippin
Gilliflower
King
Lady
Maiden Blush
Pound
Rambo
Rhode Island Greening
Seek-no-further
Sweet Bough
Tolman Sweet
Vandevere
Winesap
White Winter Pearmain
Yellow Bellflower
Yellow Newtown

The only varieties of other fruits in their lists that we recognize are Summer Bon Chretien (Bartlett) and Seckel pears; Old Mixon peach; May Duke, Ox Heart, Black Heart, Morello, Yellow Spanish and Montmorency cherries; Green Gage and Orleans plums. These patriarchal varieties which have stood the test of time bring back fragrant memories of childhood days to many of this generation.

About 1760 a German farmer known as "Dutch Jacob" brought some small but delicious pears to the Philadelphia market. He would not tell anyone where he got them. Later the land on which the original tree stood, on the bank of the Delaware just south of Philadelphia, was sold to a Mr. Seckel; thereafter the fruit was known by his name. Probably it was raised by one of the early German settlers from seed brought from Europe. It is a popular variety for the home orchard to this day.

The peach grower of today, harassed by yellows, brown rot, borer, curculio, oriental fruit moth and what not, may sigh for "the good old days" of a hundred years ago. The following description of methods of peach culture prevailing near Philadelphia in 1808 may bring tears of self pity to the eyes of peach growers of this generation:

"The common mode is to plant young trees grown from the stone without budding or grafting, dropping two stones in a hill of corn, about twenty-five feet apart in squares. They tend the corn in the usual way and the young trees grow with the corn crop at small expense. The knife is never applied to the trees, it being found injurious and to occasion the limbs of pruned trees, heavily loaded, to break. When suffered to grow at pleasure the limbs are flexible and tough and lay on the ground securely when loaded with fruit. They recover their usual position when the fruit is detached. The orchards are generally enclosed to exclude horses and horned cattle. The trees have been known to endure fifty years. They are so easily renewed that it is not uncommon to cut the trees down to the ground occasionally to permit a course of tillage, after which they are renewed by sprouts from the roots." [29]

An even more inviting prospect is spread before us by Thomas Coulter of Bedford County. He was one of the original sod mulch partisans of the state; he inveighed against the tillage of orchards for half a century. In 1803 he described his methods of renewing peaches:

"In the month of March or April, in the third year after transplanting, cut them all off at the ground . . . Let all the sprouts from the roots grow, from four to six in number. . . . When loaded with fruit they will bend and rest on the ground in every direction without injury, being rooted in the ground as though they had been planted. . . . If any of the sprouts die or split off cut them away to give place to new sprouts from the stump . . . In this way you will have trees from the stump for 100 years, as I believe. I now have trees 36, 20, 10, 5 and down to one year old, all from the same stump." [30]

After reading this tantalizing statement it may be some comfort to look at the other side of the picture. In 1805 a large fruit grower reported, "I have sold all my peaches for four pence per peck, the buyers to do the picking." Another complained that feeding peaches to hogs was not altogether satisfactory, "for after a short time they will eat only the best and refuse the others, as a man would."

The period from 1800 to 1840 was the golden age of the amateur—one who grows fruit solely for personal use and pleasure. Said one of them, "To grow fine fruits, flowers and vegetables is esteemed one of the most laudable undertakings of a country gentleman." The chief impetus to fruit growing during the early post-Revolution period was the interest of statesmen, lawyers, doctors, educators and merchants to whom the production of fine fruits on their country estates was an enjoyable hobby. They were connoisseurs on varieties. Marshall P. Wilder of Boston, who grew over 2000 varieties, "loved to take his friends through his fruit garden, when he would pick a pear from this tree and from that, slice them carefully and give each a taste."

Philadelphia was a center of amateur interest in fruit growing. Benjamin Franklin, John Bartram, William Coxe, Richard Peters, W. D. Brincle, William Hamilton, Humphrey Marshall and other men of distinction were exponents of this pleasant avocation. In 1749 Benjamin Franklin proposed that there be founded in Philadelphia an "Academy of Science" and that under the direction of that body there be established an experimental garden in which the best methods of growing fruits would be practiced and taught. The first named variety of fruit to be originated in America of which there is authentic record was the Petre pear, which was raised from seed planted by John Bartram in 1735. Bartram's Botanic Garden was the clearing house of all the colonies not only for ornamentals but also native and foreign fruits.

Pennsylvania may claim William Coxe as her own; he was born in Philadelphia and moved to a farm near Burlington, N. J., when a young man. Coxe was a member of the Philadelphia Society for Promoting Agriculture and was closely associated with the little group of men who made Philadelphia the horticultural center of the nation. He imported many varieties of fruit from Europe, propagated them in his nursery and introduced them. In 1804 he offered for sale trees of "eighty kinds of apples, ninety of pears and fifty-one of cherries, nearly all imported, and one hundred varieties of peaches." He was the pioneer pomologist of America. His *View of the Cultivation of Fruit Trees,* published in 1817, was the first native book on fruit growing. In it he recorded results secured in the first experimental orchard in America. Coxe had an inquiring mind and showed remarkable originality in his experiments.

William Cobbett, a political refugee from England who lived in Philadelphia for some time published in 1802 an American edition of a standard English work, Forsyth's *Treatise on the Culture and Management of Fruit Trees.* This was the most widely used book on the subject for many years.

Humphrey Marshall of West Bradford and William Hamilton of "Woodlands" distributed fruits as well as ornamentals from their gardens. In 1840 Hamilton imported 500 named varieties of pears in one shipment. Richard Peters, whose magnificent estate "Belmont" now is a part of Fairmount Park, was one of the best posted horticulturists of his day.

These gentlemen and others of kindred tastes made possible the organization of the Pennsylvania Horticultural Society, on November 24, 1827. It was natural that the first such society in the nation should be born at Philadelphia. That city had been the horticultural center of America for more than a century. It had a population of nearly 200,000. The only other centers of population in the state at that time were Pittsburgh including Allegheny 25,000; Lancaster 7,000 and Reading 7,000. During its early years the activities of the Society centered fully as much on fruits as on ornamentals, which are at present its almost exclusive interest. The first public exhibition of fruit in America was in Philadelphia, by this Society, on November 3, 1828. By 1840 the Society had a membership of 800.

This was the formative period in American systematic pomology; there was intense interest in the subject of new varieties. These were brought to public attention in great numbers and their respective merits debated in conventions and in print at great length and often with much heat. The Pennsylvania Horticultural Society encouraged the introduction of many promising sorts and fostered the exchange of nursery trees and scions.

Little attention was given in meetings of the Society to cultural methods and none whatever to marketing problems. An attempt was made to make the Society a scientific body by the appointment of "Professors" of Horticulture, Botany, Chemistry and Entomology. These titles were purely honorary; the Professors served without pay and were only expected to prepare "at least one essay a year on subjects connected with the application of the science to cultivation." This was a generation before the establishment of Agricultural Colleges and Experiment Stations.

The extent to which wealthy patrons of horticulture near Philadelphia indulged themselves in the exercise of their hobby is evidenced by their keen interest in the culture of dwarf fruits and the forcing of fruits under glass. They had "fruit gardens" as well as orchards. Between 1790 and 1850 dwarf trees, especially pears, were more popular with amateurs than standard trees; but even in those days of slavish copying of Old World horticulture, comparatively few American gardeners trained dwarf trees against walls or in the intricate geometrical designs so popular in Europe. Dwarfs were grown mostly in the open and trained in the natural way, like standards.

For many years a sharp controversy raged among horticultural authorities as to the relative value of dwarf and standard trees. After 1850 it became increasingly evident that dwarfs could not compete with standards in commercial operations and they gradually disappeared, save in a few home gardens.

In the fruit gardens of wealthy amateurs and for dwarf trees only, the European practice of "trenching," advocated by Thomas Rivers of

England, was followed faithfully by imported English gardeners. This consisted in digging a trench three to six feet deep around the tree at a distance determined by its size. This severed most of the lateral roots, hence it was an effective means of keeping the tree small. It also brought tardy trees into early bearing. Orthodox English gardeners filled the trench, each year, with new compost in which the roots could feed. Root pruning and trenching passed out in America about 1870.

Transportation of fresh fruits from the South then was unknown. The "season" of a fruit was limited to the range of ripening of different varieties in the same locality. Those who could afford to do so sought to prolong the season by forcing fruits under glass.

Horticultural literature from 1790 to 1850 is full of minute counsel on the forcing of fruits. M'Mahon describes the construction of "dung-heat forcing frames," which were used to ripen peaches, cherries, apricots, nectarines, figs, strawberries, pineapples, gooseberries and currants a few weeks in advance of their normal season. Tanbark or fermenting manure was used as a source of heat. Dwarf trees trained against high brick walls were enclosed temporarily in a glass structure. Firing of this crude forcing house, usually with wood, began in January or February and was continued until late April. Heat was carried the length of the wall through internal flues. Thus the trees were brought into bloom in February and the fruit ripened in April and May. After the crop was harvested the glass was removed until the following January.

Commercial forcing of fruits under glass was profitable financially in a very limited way, until southern fruits began to arrive in northern markets in quantity, about 1875. Forced fruits were grown either in pots and tubs or in borders in the "orchard house". In 1876 it was reported, "From a single peach tree planted in a tub and kept in a hot-house there have been sold, in 18 years, no less than $2,300 worth of peaches, some of them at $36 per dozen, many at $24 to $28 per dozen, and all at an average of $18 per dozen. They were sold mostly in the months of February and March."[31] Nectarines, apples, pears, apricots and other fruits also were grown in the orchard house. Pineapples were grown in pots quite extensively for the Philadelphia market up to 1856; "at $5.00 each they would pay." Forced strawberries often sold for $5.00 a quart. Even the present lavish generation is justified in wondering at these prices and the people who would pay them.

The fruit most commonly forced commercially was the grape. Varieties of the European wine grape were grown, mainly Black Hamburg, either in the cold grapery or with heat. The grapery was a commercial enterprise near Philadelphia until about 1880; in 1875 there were fifteen in Chester County alone. They were mostly lean-to glass houses, fourteen to seventeen feet wide and 100 feet long, heated by a boiler but not piped; the smoke flue was carried the length of the house. Some vines produced thirty to forty pounds each; net profits of $700 a year were reported in houses of this size.

This interesting but very expensive phase of fruit growing passed about 1875, when improved transportation facilities brought field-grown fruits from the South to northern markets during the winter and early spring at a fraction of the cost of forced fruits.

By 1840 fruit growing, while still mainly for home use and mostly for liquid refreshment, had begun to show important commercial developments especially in areas that were easily accessible to Philadelphia by wagon or boat. There was considerable commercial planting of peaches and strawberries in the Delaware river basin and the Chesapeake Bay region for the Philadelphia market. About 1840 the peach orchard of Isaac Reeve and Jacob Ridgway, on the Delaware River near Philadelphia, had more than a local reputation. In 1839 there was gathered from it "18,000 bushels of first rate fruit from 170 acres, whereof only 50 acres were in full bearing . . . During most of the season it sold on the Philadelphia market for $4.50 to $6.00 the basket of three pecks."[32] In 1847 it was reported, "Major Reybold of Delaware has about a thousand acres of peaches. They think nothing of sending 5000 bushels to market per day for some weeks."[33]

A beginning had been made in commercial fruit growing in the vicinity of Lancaster, York, Reading and Pittsburgh, but it did not develop to any considerable extent until after 1840, with improvements in transportation.

GREAT EXPECTATIONS IN GRAPE CULTURE

One of the most interesting and most tragic chapters in the horticultural history of America is the efforts of the colonists, extending over 200 years, to grow European varieties of grape for wine making. Pennsylvania played a major rôle in the drama of the grape.

The colonists, all wine lovers, were greatly impressed with the luxuriant growth of native grapes of several species. Everywhere grapes were climbing the branches of trees; this gave some foundation for the suggestion that Pennsylvania may have been the ancient Vineland spoken of by Norwegian writers. The wine made from native grapes was only fair in quality but "strong and heddy." Because of the luxuriant growth of native grapes it was assumed that varieties of the European species would grow here readily and glowing accounts were sent back to the mother country of the unrivalled opportunities for growing the vine. This stimulated immigration; the vine was one of the brightest lures of the New World.

William Penn thought his Woodland was destined to become a great wine-making country. In 1683 he wrote to friends in England, "Here are grapes of divers sorts. The great red grape, now ripe (in August) called by ignorance the fox grape because of the rich relish it hath with unskilled palates, is in itself an extraordinary grape and by art, doubtless, may be cultivated to an excellent wine." [34] He imported many cuttings of the best French and Spanish vines and planted experimental vineyards near Philadelphia, under the care of an experienced French *vigneron*. One of these vineyards was on the east bank of the Schuylkill on Lemon Hill, now part of Fairmount Park.

In 1686, Penn wrote to his steward, James Harrison, "If wine can be made by Andrew Dore at the vineyard it will be worth to the province thousands by the year; there will be hundreds of vineyards if it takes." At about the same time Penn's friend Pastorius was experimenting with a vineyard of European varieties at Germantown. Nothing came of these ventures; the foreign vines pined away and died of a mysterious "sickness." After the second visit of Penn we hear no more of his vineyards.

For more than a century thereafter other plantings of European varieties were made. All met a similar fate. The colonists simply could not believe it possible that European varieties could fail to thrive in America; repeated failures were discouraging but did not prevent others from making new attempts. One of the most ambitious of these projects was the ten-acre vineyard planted by the Harmonists, a religious-communistic group, near Pittsburgh, in 1803. This vineyard, like all that had preceded it, was a complete failure.

John Bartram was one of the first to see the possibilities of native grapes. In 1763 he wrote Jared Eliot, "I have thought much of Y^e cultivating of our native grape as y^e generality of people is so eager after strong liquors & spirits; y^e market is not to be overdone with wine and brandy; & some of our grapes is excellent for both if we could raise a sufficient quantity of vines, either by layers, cuttings or grafting, of y^e best sorts. I intend to make several tryals of these methods this spring." [35]

Soon after the Revolution Peter Legeaux, a French gentleman, planted a large vineyard at Spring Mill on the Schuylkill about thirteen miles from Philadelphia. Most of the vines were varieties of *Vitis vinifera* from the Burgundy, Champaigne and Bordeaux districts of France. Some were secured from other European countries and a few were native sorts. Legeaux was a master promoter. He succeeded in interesting a number of wealthy Philadelphians in his venture and with their support he memorialized the General Assembly in behalf of his enterprise. In May 1793, "A Company for the Purpose of Promoting the Cultivation of the Vine" was chartered by the state and commissioners appointed to sell stock. Bernhard M'Mahon of Philadelphia was secretary of the corporation. The enterprise was, in effect, a ward of the state.[36]

Stock in the company was eagerly sought by investors. For a time the prospect was bright, especially as seen through the rose-tinted glasses of Peter Legeaux. On August 16, 1793, the *Daily Advertiser* of Philadelphia reported, "The first vintage ever held in America will begin at the vineyard near Spring Mill and in a few weeks Mr. Legeaux will begin to produce American wine made upon principles hitherto unknown . . . ushering in a new era in the history of American agriculture. We shall no longer be indebted to foreign countries for this balm of life." By 1800 there were 18,000 bearing vines, and 100,000 cuttings were growing in the nursery.

The vintages of the first few years were meager but Legeaux always found some plausible excuse for this. In 1796 John James Dufour, a noted Swiss *vigneron,* inspected the most important vineyards in America, including the Legeaux venture. He found "none that would pay for one half of their attendance." The only really promising vines he saw were "about a dozen plants in the vineyards of Mr. Legeaux." In 1800 Legeaux published a grandiloquent address "To the People of the United States" in which he exhorted them to ignore native grapes and grow only Old World varieties, "as a patiotic duty." [87] Not everybody, however, was fooled by the cocksure and disputatious Legeaux. James Mease, Secretary of the Philadelphia Society for Promoting Agriculture, restated with emphasis the argument advanced by John Bartram a half century earlier—that the basis of American viticulture must be native grapes.

In spite of political sponsorship and the unfailing optimism of Legeaux, the enterprise lagged. In 1801 Governor McKean appointed commissioners to take subscriptions from all over America, as "a national affair for the public good," and to manage the operation of the project. Shareholders were to have the privilege of sending apprentices to learn the business; dividends were to be paid in this way and in nursery stock. Many subscriptions were secured and for a time hope was high.

By 1805, however, it was evident to everyone but Legeaux that the enterprise was doomed to failure. Wine of good quality was made from the European sorts but in such small quantity that the cost of production was prohibitive. The "sickness" carried off many vines to an early demise. Dissension arose among the stockholders. The vineyard was neglected. On March 31, 1806, the General Assembly passed "An Act to raise by way of lottery the sum of seven thousand dollars to enable the Company for the Purpose of Promoting and Cultivating the Vine to pay their debts" and appointed commissioners to conduct the lottery.[88] The commissioners appointed refused to serve. By 1812 the project had collapsed; the stockholders received nothing on their investment and the property was sold by the sheriff in 1822.

The Legeaux vineyard, nevertheless, was one of the most profitable ever planted in America, for the "dozen plants" mentioned by Dufour became the foundation of American grape culture. Dufour was so impressed with these few vines that when he established his great vineyard in Kentucky in 1801 and later in Indiana, he planted a few vines that had been propagated from them. These were the only profitable vines in his vineyards; the others, European varieties, perished from the "sickness."

It is clear that Peter Legeaux was mistaken, or economical with the truth, when he stated that he had secured his "Cape" grape from the Cape of Good Hope. He was so strongly prejudiced against native grapes that he was not willing to admit that anything worth while could come from them. Yet we have it on the authority of William Bartram, son of John Bartram and a painstaking botanist, "It was supposed to be a hybrid between *Vit. sylestris* (common bunch grape) and *Vit. vinifera,* because it was found on the rocky hills near the Schuylkill, above the upper ferry in the neighborhood of an old vineyard of European origin; but I believe it to be an American." [39] We can trust his judgment. This variety had been grown "long before the Revolution" in the vicinity of Philadelphia under the names of Schuylkill Muscadell, Taskers and Alexander, mostly the latter.

The "Cape" grape of Legeaux probably was a variety of the native fox grape, *Vitis labrusca.* Being a native it was not subject to the "sickness" that had blasted vineyards of European varieties in America for two centuries. This, it is now known, was caused mainly by attacks of various fungus disorders, particularly downy mildew and black rot; also by the phylloxera, or root louse.

Pennsylvania gave impetus to the culture of the grape by being the first state to plant the Cape, or Alexander, on a commercial scale. York was one of the first centers of successful grape culture in America. In 1818 Thomas Eichelberger, a German vine dresser of York, planted four acres, which soon were increased to twenty acres. By 1826 there were 150 acres in the vicinity of York, mainly Alexander. U. P. Hedrick says, "In looking up the history of varieties of grapes, a surprising large number may be traced back to this early center of the industry. York and Lancaster counties must be counted among the starting places of American viticulture." [40] The Alexander grape passed out of cultivation about 1850, being superseded by a better native variety, the Catawba. This was introduced by another Pennsylvanian, John Adlum, author of the first American book on grape growing. [41]

Among the many contributions of Pennsylvania to American pomology, none is more outstanding than its pioneer work in the culture of native grapes. The foundations of American grape growing were laid in southeastern Pennsylvania.

VEGETABLE GARDENING

The interest of our forebears in vegetable gardening was meager indeed as compared with their absorbtion in fruit growing. Probably this was because vegetables could not readily be converted into "comfortable drinks" and because their distinctive value in the diet was not fully recognized then. Nowhere were vegetables the subject of enthusiasm, professional or amateur, as were fruits. They were grown for home use on every farm but usually in scant variety and quantity. Vegetable gardening as a business did not appear until after 1800 and not until after 1830 was there any considerable development in this phase of horticulture.

The early colonists brought with them seeds of all the common vegetables of Europe. In 1685 William Penn enumerated the treasures of his garden at Pennsbury: "I have had in my own ground Kidney Beans and English Pease of several kinds, with English Roots, Turnapes, Carrets, Onions, Leeks, Radishes and Cabbidges. . . . Also I have such plenty of Pumpkins, Musmellons, Water Mellons, Sqwashes, Coshaws, Buck-hen, Cowcumbers and Sinnels of Divers kinds."[42] In the same year Thomas Budd listed "the Garden Fruits that groweth well" in the new country. He included "Cabbage, Colworts, Colliflower, Sparagus, Carrots, Parsnips, Turnips, Oynions, Cowcumbers, Potatoes, Punkins, Water- Mellons, Musk- Mellons, Squashes." The latter four had been grown by Indians.

Some years later colonial gardens were enriched by the addition of sweet corn, tomatoes, celery, beets, lettuce, egg plants, peppers, spinach and several others, including the sweet potato, which was native to tropical America. The tomato, which also was native to South America, had been grown there for centuries but was regarded as poisonous by North American whites until about 1820. It was brought to Pennsylvania by a French refugee from San Domingo in 1798 but did not appear on the Philadelphia market until 1829.

The first named variety of sweet corn was the Papoon, which had eight rows and a red cob; it was brought to Plymouth, Mass. in 1779 by Captain Richard Bognall on his return from Sullivan's Expedition in western New York. He reported that his seed was secured from Indians near the upper reaches of the Susquehanna, but whether in New York or Pennsylvania is not clear. Sweet corn was grown very little in Pennsylvania until after 1860; most people continued to use roasting ears of field corn.

The almost universal culture of vegetables on farms throughout the province is attested by several observers. In 1759 Acrelius reported, "Vegetable gardens are kept for almost every house. There are generally cultivated beets, parsnips, onions, parsley, radishes, Turkish beans, large beans, pepper grass, red pepper, lettuce, head lettuce, German lettuce, and scurvy grass. Anything else is regarded as a rarity."[43] According to Henry B. Plumb Connecticut settlers of the Wyoming Valley had "a garden of about half an acre attached to each house and this was the first land manured and plowed in the spring."[44]

Joseph Doddridge records that in southwestern Pennsylvania, "Every family, besides a little garden for the few vegetables which they cultivated, had another small enclosure containing from half an acre to an acre which they called a truck patch, in which they raised corn for roasting ears, pumpkins, squashes, beans and potatoes. These, in the latter part of the summer and fall, were cooked with pork, venison and bear meat for dinner."[45] Included in most gardens was a small patch of hops which were used for yeast in making bread and for brewing beer, ale, porter and "small beer."

Vegetable gardening on the frontier was not without hazards, as we learn from an entry in the diary of James Kenny at Pittsburgh on June 7, 1762: "Having Planted out abo^t four Hund^r of Cabbage Plants, there is not I think fourty left but what y^e Grasshoppers has Eaten."[46]

Pennsylvania Germans almost universally had good gardens. These were the responsibility of the *hausfrau,* who did all the work in them except plowing and manuring. "German women," says Samuel Preston, "were skillful gardeners. They always took bundles of garden seeds that they had brought from Germany and greatly improved gardening in Pennsylvania, both in quality and in a greater variety of vegetables." In early colonial days turnips, onions and cabbages were the principal vegetables in German gardens, most of the latter being made into *sauer kraut.* After 1780 a much greater variety of vegetables was grown.

In 1789 Benjamin Rush made this appraisal of German gardens: "The German farmers have large and profitable gardens near their homes. These contain little else but useful vegetables. . . . Pennsylvania is indebted to the Germans for the principal part of her knowledge of horticulture. There was a time when turnips and cabbage were the principle vegetables used in the diet by the citizens of Philadelphia. This will not surprise those who know that the first English settlers in Pennsylvania left England while horticulture was in its infancy in that country. It was not until the reign of William III that this useful and agreeable art was cultivated by the English nation. Since the settlement of a number of German gardeners in the neighborhood of Philadelphia the tables of all classes of citizens have been covered with a variety of vegetables in every season of the year."[47]

The statement by Benjamin Rush indicates that there was some commercial vegetable gardening in the vicinity of Philadelphia before 1800. Probably there were a few truckers in the neighborhood of Lancaster and Reading also. Vegetables could not be grown on a large scale until horse-drawn cultural implements were available, greenhouses or cold frames for starting plants were within the reach of men of moderate means, and better transportation facilities than the horse and cart were at hand. These did not come until after 1830.

Philadelphia was a center of interest in vegetable gardening, as well as fruit growing. The first notable American book on gardening, Bernhard M'Mahon's *American Gardeners' Calendar,* was published in Philadelphia in 1806 and William Cobbetts' *American Gardener* in 1819. About 1784 David Landreth and Son established in Philadelphia the first seed house in America. In 1811 this firm distributed the first really white variety of potato; previous varieties had been yellowish. In 1820 it introduced the tomato; this was a yellow variety. In 1847 the firm moved to Bristol where it developed one of the largest seed farms in the country.

ORNAMENTAL GARDENING

It could not be expected that pioneers in a new, rough country would have either time or inclination to engage in the cultivation of ornamentals. The struggle to extirpate wild plants so that crops could be grown left them with little desire to spend time in growing other plants for decorative purposes. Most pioneer homes were bare of ornamentals.

Nevertheless, the love of flowers which was instinctive in most of the nationalities that peopled the colony, especially the English and Germans, soon led to attempts to embellish the home premises. Usually the woman of the farm was responsible for whatever was done in this respect. Pastorius encouraged the Mennonite founders of Germantown to raise flowers. In *Pennsylvania Pilgrim* Whittier says of him:

> The flowers his boyhood knew
> Smiled at his door, the same in form and hue.

After 1750 the art of ornamental gardening received more attention, especially near Philadelphia.

Like most Englishmen, William Penn was an ardent lover of flowers. His country estate, Pennsbury, in Bucks County, was situated on a gentle eminence facing the Delaware. Its two gardens, upper and lower, were the wonder of the province. Penn gave them personal attention. When in England he repeatedly wrote to his steward giving meticulous directions about establishing lawns and caring for flowers. Beside many European flowers, Penn transplanted some of the most beautiful native species to his gardens. On May 11, 1685, he sent to his steward "diverse seeds for gardens"; and on August 4 of the same year he wrote, "I would have Nicholas [the gardener] have as many roots and flowers next spring, by transplanting them out of the woods, as he can." Later in the same year he wrote, "I have in my own ground . . . an abundance of sorts of Herbs and Flowers . . . I have but few seeds that have mist except Rosemary seed, and being English might be old."

In 1685 Thomas Budd listed "Roses, Carnations, Tulips and Garden Herbs" as plants that thrived in the province. The ornamentals most commonly grown around farm homes were roses, lilacs, snowballs, tulips, clove pinks, sunflowers, hollyhocks, marigolds and morning glories. Tulips were special favorites of Germans; for some they had a mystical religious significance. At first, most roses were single; later the damask rose and the moss rose became favorites. Sweet briars or Eglantine were brought from England and Dog rose *(Rosa canina)* from Germany. Climbing roses were grown much more commonly than at present.

In spring the never-to-be-forgotten fragrance of lilacs perfumed the ir. The lilac is more intimately associated with Pennsylvania farm homes than any other flowering shrub. Even after the house has been destroyed and only the tumbled-down foundation remains, neglected ilac bushes continue to bloom bravely, in spite of the encroachment of he forest, faithfully marking the spot where once was a family hearthstone. "A pathetic trait of many old-time flowers," says Alice Morse Earle, " is their persistent clinging to life, even after generations. The sites of colonial houses long since destroyed can still be traced by the cheerful faces of these garden strays."

The gardens of the country seats of colonial gentlemen contained a great variety of flowers. There were bright-faced pansies or hearts-ease, golden daffodils nodding their heads in the spring breeze, stiff-necked hyacinths, freckled foxgloves, sturdy sweet williams, glowing peonies, stately Canterbury bells, larkspurs as blue as the sky, ubiquitous scarlet runners, purple ragged robins, succulent portulaccas, frosty dusty millers, dainty clove pinks and carnations, flaunting iris or *fleur de lis*, luminous evening primroses, rusty marigolds, striped ribbon grass, lemon-colored primroses, flamboyant poppies, sleepy four-o'clocks, modest sweet alysums, prosaic stocks, flaunting tiger lilies.

Syringas, petunias, honeysuckle, sweet peas and autumn phlox enveloped the garden in Elysian fragrance, each in its season. They overpowered even the pungent aroma of the closely clipped hedge of boxwood that surrounded the garden, which often was planted in intricate geometric designs. In early spring pendants of lavender wistarias glorified the rustic arbor and romantic love-seat beneath it.

There, also, was the herb garden—rosemary (for remembrance), sage, ansy, mints of several kinds, lemon balm, horehound, lavender, rue, savory, ambrosia, thyme and many others, each valued as a specific for the cure, real or fancied, of some ill of the flesh, for seasoning food or for fragrance.

Between 1750 and 1850 the art of gardening reached its highest point n America at Philadelphia. Some of the country seats of gentlemen near that metropolis were not excelled anywhere, not even by those in England after which they were patterned. A number of private estates had large collections of ornamentals secured from all quarters of the globe. William Penn set the pace with his elaborate garden at Pennsbury; it contained many exotic species.

"Fairhill," the estate of Isaac Norris on the Germantown Road, was a noted show place about 1730. Toward the end of the eighteenth century one of the most famous country estates was "The Woodlands," home of William Hamilton. This was situated on the west bank of the Schuylkill. The garden, which contained many exotic species, was broken up in 1820. "Belmont," the country seat of Judge Richard Peters, now a part of Fairmount Park, was a mecca for horticultural enthusiasts from 1790 till 1820. "Lemon Hill," the estate of Henry Pratt, was considered to be the most perfect illustration of formal gardening in America; it was at the height of its fame about 1820. "Cliveden," home of Chief Justice Chew, was another noted example of geometrical design in gardening. These are but a few of the many estates that made Philadelphia the center of interest in ornamentals for more than a century.

Plant materials in botanic gardens differed from those in the gardens of country seats in that an attempt was made to secure a more complete collection of certain families or genera, for scientific purposes, rather than for display only. What was probably the first botanic garden in America was established in 1694 by Kelpius, leader of a little band of German mystics, at their monastery on the Wissahickon. It consisted mainly of medicinal herbs or "simples." Of a similar nature but including many rare ornamentals was the garden of Christopher Witt at Germantown, established about 1710.

The most famous botanic garden in America was that of John Bartram (1699-1779) at Kingsessing on the Schuylkill, three miles from Philadelphia, begun in 1728. The great Swedish botanist, Linnæus, pronounced John Bartram the most outstanding natural botanist of his time. He collected, multiplied and distributed native trees, shrubs and plants found on his numerous botanical explorations in America and those secured by exchange with collectors and nurserymen in Europe. His botanic garden was the largest and best collection of trees and shrubs in America. He sold plants and seeds to plant-lovers at home and abroad; for years he was the chief medium for exchange of plants between Europe and America.

After Bartram's death, the garden was continued by his sons, William and John. His home still stands in the midst of the garden which now is a public park of Philadelphia. A few of the trees planted by him, now of great age, still keep his memory green amidst the bustle of the great city that has long since engulfed the quiet garden of this great Quaker.

John Bartram was perhaps the first plant breeder in America. In 1739 he wrote, "I have made several successful experiments of joining several species of the same genus, whereby I have obtained curious mixed colors in flowers, never before known."[48]

John Bartram's cousin, Humphrey Marshall, established a notable botanic garden at West Bradford, Chester County, in 1773. In 1785 he published his celebrated *Arbustum Americanum,* a description of the trees and shrubs native to the United States. One of his neighbors, William Jackson of London Grove, began an interesting collection of plant materials in 1777. About 1800 Joshua and Samuel Pierce of East Marlborough had a collection of evergreens that was not surpassed in America. Bernard M'Mahon, premier nurseryman and seedsman of young America, multiplied and distributed all the interesting horticultural novelties collected by the Lewis and Clark Expedition in its journey to the Pacific. His gardens and nursery were near the Germantown Pike, between Philadelphia and Nicetown. The country seats and botanic gardens near Philadelphia contributed greatly to the development of American horticulture.

Lombardy poplar and weeping willow were the first trees to be planted commonly around farm homes and as street trees. "The houses in Germantown are very universally shaded with weeping willows and Lombardy poplars," observed John C. Ogden in 1799.[49] Weeping willow was introduced into America about 1765 by Governor John Penn who planted it in his garden on South Third Street, Philadelphia. Lombardy poplar was introduced into America by William Hamilton of Philadelphia in 1784. It is strange that these two introduced species should have been preferred to much superior native trees, such as the sugar maple, pin oak, beech and sycamore; presumably these were not appreciated because they were common.

Although country seats and botanic gardens displayed a wealth of trees for ornamental use, few were planted around farm homes. This was due in part to the prevailing belief that the dense foliage of trees was responsible for "stagnant air" which favored the occurrence of fevers. Not until after 1800 were native trees and shrubs, particularly sugar maple, white pine, sycamore, and red-bud or Judas tree, commonly planted around farm homes for ornament and shade.

GREENHOUSE HORTICULTURE

Greenhouses were described by M'Mahon in 1806 but few were built except for forcing fruits. They were heated by means of hot air flues from a stove, or by the use of fermenting manure or tanbark. Steam heating of greenhouses originated in England about 1820 and hot water heating about 1830 but neither was used here before 1840. The few greenhouses in Pennsylvania before 1840 were attached to the gardens of the wealthy and devoted to the forcing of fruits and the culture of exotic flowers, particularly camellias, for private use. The commercial greenhouse industry did not develop until after 1860.

Early greenhouses had comparatively little glass. M'Mahon advised that "one third of the front side of the roof for the whole length of the house be formed of glass work . . . and the sides should have as much glass as possible." [50] Quite commonly the roof was made of portable sash which were removed in warm weather. A majority were "lean-to's," with high back walls.

The first floral magazine in America, the *Floral Magazine and Botanical Repository,* was published in Philadelphia for a few years, beginning in 1832. It was edited and published by David Landreth and Son, nurserymen and seedsmen. The first native book on flowers, *American Flower Garden Directory,* by Robert Buist, was published in Philadelphia in 1839. It was soon followed by his *Rose Manual.* These books had wide circulation and went to several editions. The first flower show of any magnitude to be held in America was that of the Pennsylvania Horticultural Society in 1829.

SILK CULTURE

While not strictly a horticultural enterprise, silk culture appropriately may be considered under horticulture since the food of the silk worm is mulberry leaves and since the propagation of mulberry trees in nurseries was the central feature of the silk craze of 1826 to 1839.

In Pennsylvania, as in other colonies, much was expected of silk culture but little realized. In 1725 James Logan wrote, "The culture of silk in this country is extremely beneficial and promising." Moravians planted European white mulberry trees at Bethlehem and made silk for a time. This and similar attempts by other religious groups were not successful; silk culture involves many long and tedious hand operations which were practicable in Europe, China and Japan where labor was plentiful, but not in America where labor was scarce and dear.

Here and there a little silk was made, especially by Old World religious groups. Benjamin Franklin, agent of the colony in Great Britain, sought assiduously to establish the industry in Pennsylvania. About 1765 he sent back to his people silk worm eggs and mulberry cuttings. On January 5, 1770, Franklin wrote to the American Philosophical Society urging it to encourage silk culture. Responding to this request, on February 2 of that year the Society presented a petition to the General Assembly: "That a public filature be established at Philadelphia and afterwards at other Places in the Province . . . for winding Cocoons. . . . That to encourage all Persons to cultivate Mulberry trees, raise Silk worms & bring their Cocoons to the filature . . . a sum of not less than £500 p. annum should be appropriated during the aforesaid term of five years." [51]

The Assembly failed to make the proposed appropriation so a public subscription was taken. This yielded £900. In June 1770, a filature was opened in a house on Seventh Street, between Arch and High Streets. Gratified at this evidence of public interest, in 1772 the Legislature granted £1,000 to the Society for the encouragement of silk culture.[52]

Before the outbreak of the Revolution a little silk was produced in various parts of the province, particularly in Lancaster County. In 1770 Susanna Wright of Columbia made a piece of mantina sixty yards long from home-made cocoons; this cloth was worn as a court dress by the Queen of England. By offering attractive premiums, 2,300 pounds of cocoons were brought to the filature in 1771; many of these, however, came from New Jersey.

This enterprise terminated with the Revolution. It would have failed eventually, anyhow, because of insuperable economic obstacles. There were no serious obstacles to the growing of mulberry trees and the rearing of silk worms on their leaves; but the fact remained that people could earn twice as much, or more, at other labor. An effort was made to convince farm women that they should care for silk worms in their "spare time," but housewives had more necessary and more productive employment. During the Revolution nurserymen who had mulberry trees to sell endeavored to keep the balloon inflated, but to no avail. In 1781 the General Assembly directed the American Philosophical Society to "wind up" the affairs of the now moribund silk society.[53] Thereafter silk culture was practically extinct in Pennsylvania until 1826.

The spark which fired the powder of renewed enthusiasm for the culture of "the great and noble Silke-Worme" was the introduction of *Morus multicaulis* in 1826 by Gideon B. Smith of Baltimore and William Prince and Son of Long Island. They began to advertise the superiority of this species of mulberry for silk worm culture over *Morus alba,* the species used heretofore. It could be propagated very easily by hard wood cuttings, grew rapidly and produced enormous leaves.

The spark became a conflagration. This was a period of "easy money" and wildcat investments. People throughout the East, especially nurserymen, took leave of their senses. "The fever attacked both male and female," relates William H. H. Davis. "The newspapers teemed with the most marvellous accounts and the inducements to fortune held out were hardly second to the South Sea Bubble and the Merino sheep craze. . . . An acre of nursery trees near Camden, N. J. changed hands four times without the trees being taken from the ground, going up from $1,500 to $4,500. The last purchaser was offered a thousand dollars advance but refused it. In some instances the trees brought almost fabulous prices. . . . One sale in Germantown amounted to $81,218.75. A profit of $8,000 is said to have been realized from a single acre. . . . Thousands of acres of trees were planted. . . . Farms were mortgaged to raise money to go into the speculation."[54] At Newtown and Doylestown, Bucks county, buildings were erected to rear silkworms.

The enthusiasts were mostly town dwellers—ministers, doctors, lawyers, clerks—but farmers were by no means immune, especially after reading this: "Few farmers have any idea of the vast profits in the silk business. Four hundred and twenty pounds of silk were produced from four acres planted with mulberry. The silk sold for $3.50 per pound, amounting to $1,470." Net profits of 47 to 112 per cent annually on an investment of $437 an acre were confidently predicted. "When the fact is generally known that any young lady, by a few hours of pleasant recreation each week at home, can clothe herself in a splendid suit of native silk at the low price of 12½ cents a yard, there will not be a garden without its mulberry trees."[55] It was predicted, "Every available acre from New England to the Gulf will be covered with the mulberry. Every farm will have cocooneries and the farmers' wives and daughters will feed the worms and spin and twist the thread."

At the height of the mania one year old mulberry trees sold for $2.00 to $5.00 each, though they cost but a few cents to produce. Many nurserymen gave up all other propagation in order to make the most of this golden opportunity. Fortunes were made—by nurserymen—in a single season. One super-heated propagator announced, "On one acre, 30,000 trees can be raised and the sum of $35,000 realized in a single season." Philadelphia was the center of the craze; in 1838 there were nearly a million trees within fifty miles of the city. The largest plantings were at Burlington, N. J.

One writer thus describes the daft behavior of people who had been attacked by "*multicaulis* fever": "They met in solemn conclave over bundles of *Morus multicaulis* twigs, discussing seriously the glorious time when, in the not distant future, every farm should be a nursery for the young trees, every home have its cocooneries attached. . . . The farmers' wives and daughters, when not engaged in feeding the worms, were to reel the silk and perhaps spin and twist it; until silk should become as cheap as cotton and every matron and maid rejoice in the possession of at least a dozen silk dresses."

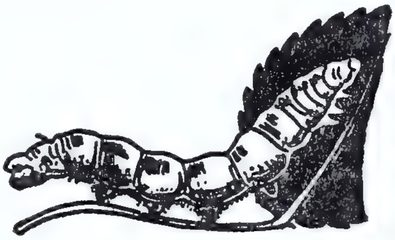
In vain did a few wise heads advise caution: "We hear daily reports of individuals who have made their thousands and tens of thousands of dollars, rising suddenly from poverty to wealth. The store-keeper, the farmer, the mechanic, the clerk, the teacher are dazzled with the golden vision and rush from their useful employment into the grand speculation. . . . It seems evident, however, that where all are planting and propagating trees to sell and none are purchasing to feed silk worms the trade must soon come to a close."

Peter S. Duponceau of Philadelphia was one of the few men of his time who were devoted to non-speculative silk culture. In 1834 he established in Philadelphia, at his own expense, a "School of Filature" for teaching the delicate art of reeling silk from cocoons. He also built large cocooneries. The enterprise failed from lack of public support.

By 1830 the Pennsylvania Silk Society was in excited operation. In 1832 Governor Wolf recommended to the General Assembly that the state subsidize silk culture. It was reported, "At Economy . . . the culture and manufacture of silk has been successfully attempted and the results afford the most flattering inducements to similar enterprises, since Mr. Rapp, the actuary of the Economy Society . . . has found no difficulty in keeping the worms healthy, in unwinding or reeling the silk, or weaving it . . . The Society have made extensive plantings of the white mulberry and have some millions of spinsters (worms) at work. Their silk cloths are remarkable for their firmness and luster and are earnestly sought for at prices which amply repay the manufacture." [56]

In 1840 the General Assembly passed "An Act to Promote the Culture and Manufacture of Silk," supplementing similar acts of 1832 and 1836. Among other provisions this act authorized silk manufacturing companies to "establish schools for the instruction of youth . . . in the whole art and mystery of silk culture." [57] The Philadelphia Silk Culture and Manufacturing Company was incorporated in 1837." [58]

The bubble burst in 1839 with a resounding pop. It developed that *multicaulis* trees could not withstand even the comparatively mild winters of Philadelphia. Thousands of trees in nurseries were killed outright. In the spring of 1840 nursery trees which had sold for $2.50 to $5.00 each in 1836 found few purchasers at one cent each for use as pea-brush. The unusually cold winter of 1844 wiped out most of the remaining trees. Even if they had survived, silk culture never could have become a profitable occupation; it could not have competed successfully against the cheap labor of Europe, China and Japan. So closed one of the most amazing chapters in the history of Pennsylvania agriculture.



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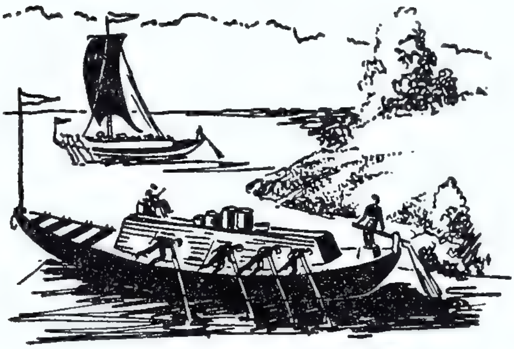


Keelboats on the Allegheny, 1880

TRANSPORTATION

COLONIAL Pennsylvania was predominantly agricultural. Since most farm products are bulky or perishable, transportation was an acute problem. Little progress could be made from subsistence farming toward commercial farming until quick and cheap transportation was available.

Waterways

The chief means of transportation of early settlers were natural waterways, which determined the location of most of the first settlements. Pennsylvania was particularly fortunate in this respect; the Delaware, Schuylkill, Susquehanna, Allegheny and their tributaries gave access by canoe and boat to most of the province. The early settlers built no roads; the cost of roadbuilding in a sparsely settled community was prohibitive and labor and capital were scarce. As pioneers pushed westward they located their claims near streams. "We calculated that a farm in the neighborhood of these rivers," said a settler in the vicinity of Pittsburgh, "was nearer the market of any part of the world than a farm within twenty miles of Philadelphia. On this principle we had all calculated on settling in this country." [1]

Dug-out and birch bark canoes, similar to those used by Indians, were used first. Dug-outs were preferred for most purposes; birch bark canoes, being light, were more suitable for long trips especially when a portage was necessary. A dug-out was a hollow log about twenty feet long and two or three feet in diameter. The Indians made one by burning out the interior, a little at a time, and scraping off the charred wood after each burning. They laid dry branches on the log and set fire to them, using water to keep the fire from spreading too far on the sides. An Indian could make a dug-out in three weeks. The Whites could make one much more quickly with metal tools.

In 1749 Peter Kalm described the dug-outs used on the Delaware: "Canoes are boats made of one piece of wood and are much in use among the farmers and other people upon the Delaware and some little rivers. For that purpose a very thick trunk of a tree is hollowed out; the red juniper or cedar, the white cedar, the chestnut, the white oak and the tulip tree are commonly used. Canoes of red and white cedar are reckoned the best because they float very lightly on the water and last twenty years. . . . They are narrow, round below, have no keel and therefore may easily be upset. . . . They can carry six persons who, however, must in no way be unruly but sit on the bottom of the canoe in the quietest manner possible, lest the boat capsize. The Swedes in Pennsylvania and New Jersey near the rivers seldom have any other boats in which to go to Philadelphia, which they commonly do twice a week on market days."[2]

Some dug-out canoes were large enough to carry 100 to 150 bushels of wheat. Their passage down the Schuylkill and Delaware was hindered by dams, weirs and baskets built by farmers along the shores to catch shad and other fish. By Act of Assembly in 1683 these contrivances were outlawed in navigable rivers but this law was not enforced. It was re-enacted in 1700 and again in 1734.

No love was lost between "river men" and "shore men"; there were many fist and stone fights between them and numerous court actions. Listen to the plaint of one river man: "Isaac Smalley affirms that in going down ye river (Schuylkill) with 140 bushels of wheat he got fast on a rock dam, and in order to save ye load from being all lost he was, much against his mind, obliged to leap into ye river. The water being to his chin, frequently dashed into his mouth, where between times he breathed, and he and his pardner held ye canoe with great labour, while a young man there present ran above a mile to call help to get off."[3]

Between 1731 and 1740 there was open warfare between river men and shore men. Sticks and stones flew; many heads were broken. "Fleets of canoes would put off on the voyage together for the purpose of mutual protection to themselves and the mutual destruction of all fish-dams, weirs and baskets. On the other hand, the shoremen would congregate in their respective neighborhoods for the protection of their property thus assailed and should any unlucky wights get fast with their canoes or venture too near shore they would bring artillery (stones) to bear on them."[4] About 1738 shoremen, after contending for half a century, yielded to the majesty of the law.

The birch bark canoe, being light, was even more unstable in balance than the dug-out. The technique of travel in one is described by an English woman: "The Cannoo was very small and shallow, which greatly terrified me and caused me to be very circumspect, sitting with my hands fast on each side, my eyes steady, not daring so much as to lodge my tongue a hair's breath more on one side of my mouth than tother, nor so much as to think of Lot's wife, for the very thought of turning would have oversett our wherry." Portage paths between different streams or around rapids were important avenues of travel; frequently it was necessary to carry canoe and goods several miles.

Dug-outs remained the chief means of transportation for nearly a century. Durham boats first appeared on the Delaware about 1750. They were built at a settlement of that name a few miles south of Easton and were first used to float the products of the Durham iron furnace to Philadelphia. By 1758 flour was being transported in Durham boats to Philadelphia from mills at Minnesink.

The Durham boat was about sixty feet long, eight feet wide, two feet deep and flat-bottomed. The bow and stern were sharp and were decked. A running board extended the whole length on each side. When fully loaded it carried fifteen tons and drew twenty to twenty-two inches. A good load was 150 barrels of flour or 600 bushels of shelled corn. It had a mast and two sails but the usual motive power was the current. The crew consisted of five men, one at the stern to wield a long steering oar and two on each side equipped with long poles for pushing the boat forward.

In freshets Durham boats drifted down stream, with occasional use of poles or a pair of oars eighteen feet long. They were moved upstream by means of "setting poles," twelve to eighteen feet long and shod with iron. Two of the crew started at the forward end with their poles set on the river bottom and walked on the running board back to the stern, thus pushing the boat forward.

Durham boats were used chiefly on the Delaware, Schuylkill and Lehigh. "Reading boats," also used on the Schuylkill, were quite similar. In 1794 Cazenove described them as "60 feet long by 8 feet wide, costing £45. They are very flat and without a keel, thus they carry to Philadelphia a load of five tons when the Schuylkill is low and twelve when it is high. . . . The farm produce is shipped from here [Reading] to Philadelphia on these flat boats."[5] A Reading newspaper for March 6, 1802 reports, "Within the present week there were taken down on the Schuylkill to the mills and city of Philadelphia, in the boats of this place, in one day, the following articles: 1201 barrels of flour, 1425 bushels of wheat, 17 tons of bar iron, 1492 gallons of whiskey, 365 pounds of butter and 500 pounds of snuff."[6]

Arks were the most common ships of commerce on the Susquehanna and Allegheny rivers. The Susquehanna, though far-reaching, is shallow and rocky; had it been deeper thousands of deep-draft vessels, some of them sea-going, would have plied to and fro in the interior of the province. This would have radically changed the history and industrial development of the state.

Between 1794 and 1830 arks were used to carry farm products from northern and central Pennsylvania to Baltimore and Philadelphia, also to transport coal, iron, lumber, staves, salt and gypsum. This leviathan of inland waters was about ninety feet long, sixteen feet wide and four feet deep and had a capacity of sixty tons. It was flat-bottomed, blunt-nosed and very heavy. About 7600 feet of two-inch planks were used in its construction. It cost $70. Attached to the stem post at each end was a huge oar thirty feet long. Four men were required to navigate an ark, two at each oar. Arks descended the river only in freshets. Unlike Durham boats they did not return; at journey's end they were broken up and sold for lumber.

Some arks were smaller. In 1803 Thaddeus Harris described those in use on the Allegheny and Ohio rivers: "Numerous trading boats pass continuously, laden with flour, whiskey, peach brandy, cider, bacon etc. . . . destined for Kentucky and New Orleans or the towns on the Spanish side of the Mississippi. These boats are generally called 'arks' and are said to have been invented by Mr. Krudger on the Juniata, about ten years ago. They are square-nosed, flat-bottomed, about forty feet by fifteen, with sides six feet deep, covered with a roof of thin boards and accomodated with a fire-place. They will hold from 200 to 500 barrels of flour. They require but four hands to navigate them; carry no sail and are wafted down the current." [7]

Navigation of arks on the Susquehanna, especially when it was in freshet, was a perilous experience. Not more than two arks out of three reached tidewater with their cargoes. Many were piled up on rocks in rapids or plunged to the bottom. Drownings were frequent and many of the crew had hairbreadth escapes.

The vicissitudes of river transportation were set forth by David Scott in 1827: "A voyage across the Atlantic does not invoke so much danger to life and property as the navigation of the Susquehanna from the New York state line to the head of the tide. . . . Property can only be floated down in time of high floods, which seldom occur except at the breaking up of the ice and the melting of the snow in the spring season. During these floods the river is not navigated with any degree of safety or success, if at all, for more than a week or ten days. The consequence is that the whole trade of the Susquehanna descends at nearly the same time; the markets in the towns and villages along the river are overstocked and the owners are frequently obliged to sell at a ruinous sacrifice. . . . The loss occasioned by accidents incident to river navigation is estimated at five per cent a year." [8]

The flat-boat used on central Pennsylvania waters was quite similar to the Durham boat but larger. It required a crew of six to eight men. Those used on the Susquehanna carried great loads of beef, pork, grain, whiskey, lumber and pig-iron to tidewater markets. Rafts were mostly a method of getting lumber to market but some carried farm produce. In 1792 a Baltimore paper reported, "A number of rafts are in from Tioga Point [Bradford County] loaded with hay, grain, potatoes and shingles." After 1800, keel boats or "broad beams" largely displaced flat-boats and rafts on the Susquehanna until canals were opened.

Farms located on the many tributaries of the Susquehanna depended almost wholly on water transportation. A pioneer farmer of Centre County, on Penn's Creek, tells of methods in vogue about 1790: "The surplus wheat was ground into flour and barreled in home-made wooden barrels. Toward spring large arks were built. The floors were made of hewed timber packed with tar and pitch to make them water-tight. The sides were made in the same manner and they were roofed with boards. In the spring, when the freshet came, these arks were manned by a pilot, a steersman and a bowman and were put afloat and proceeded to Selinsgrove. The trip from The Forks [Coburn] was made in one day. The arks and flour were sold there, manned by other crews and proceeded to Philadelphia. The farmers then returned by night through the Seven Mountains, ready for another trip while the freshet lasted, often encountering wolves and panthers on the way. That was their only outlet to the market with their grain." [9]

Thomas Cooper, writing in 1794, says, "A boat with 1600 bushels of wheat has gone from Penn's Creek to Baltimore. The expense of transporting grain from Sunbury to Middletown is £3 per 100 bushels. The time employed varies from two to four days." [10] In 1809 flour was carried down the Raystown Branch of the Juniata to Baltimore for "ab't 1½ (shillings) p. Barrel." [11]

In May 1807 Philip Benner, a prominent iron master and farmer of Centre County, wrote, "I sent Cambridge down [Bald Eagle Creek and Susquehanna River] with an ark to Baltimore, with 200 barrels of flour and ten tons of rolled iron, with which he arrived safely. . . . On the eighteenth of this month he started again with the same load with one ark . . . If we have another fresh this spring I shall come down, as we have another ark ready." [12]

The number of arks, flat-boats and rafts descending the Susquehanna from March 3 to July 1, 1826, was reported to be:

"1037 arks, value	$1,037,000
164 keel boats, value	164,000
1090 rafts of lumber, value	327,000
	$1,528,000

"An ark carries 1600 to 2000 bu. wheat, $1600; or 400 to 450 bbls. flour, $2,000; or 100 to 120 bbls. whiskey, $3,000." [13]

Methods of transporting farm produce on the Allegheny and Monongahela and their tributaries were quite similar to those on the Susquehanna. The first flat-boat went down the Ohio to New Orleans in 1782. This was the beginning of a brisk trade between western Pennsylvania and the Spanish at New Orleans, mainly in flat-boats built at Pittsburgh, Brownsville and other points along the rivers. Elias P. Fordham describes Orleans boats as "from 12 to 25 feet wide and from 30 to 90 feet long. They are sold when they arrive at their destination and are broken up. Not 100 nails are used in building one, but they are stuck together with wooden pins. They will carry 700 barrels of flour. They cost 1 $ p^{r} foot in length and sell for ¼ $ per foot. They are manned by four men each." [14]

Flat-boats, arks, barges and scows that carried produce down the Ohio were modifications of the French bateaux. They were of all sizes and shapes; some were nearly square. All were made of rough planks, had square ends and were partly roofed over for shelter. The sweeps at the stern and sides were for steering, not for propulsion; the boats drifted to their destination. A farmer who had accumulated a sufficient quantity of flour, grain, corn meal, beef, pork and whiskey built one and took it down the river in late winter or early spring. At night it was tied up at any convenient place where firewood and fresh water were available. The trip to New Orleans was high adventure for the farmer and his sons. They returned home overland.

What the Conestoga wagon was to turnpike transportation the keel boat was to waterways, especially on western Pennsylvania rivers. They were slender, of light draft and speedy. Ordinarily they were sixty to eighty feet long, eight to ten feet wide and pointed at both ends. Unlike flat-boats they made the return trip upstream, being poled or sailed. Keel boats were built and operated by professional river men; flat-boats were built and operated by farmers.

Only in the Pittsburgh area were schooners and steamboats used to any extent in marketing farm produce. "In 1800 certain farmers near Elizabeth built a schooner of 250 tons burden and launched it in 1801, christening it the 'Monongahela Farmer.' Her cargo . . . consisted of 721 barrels of flour, 500 barrels of whiskey, 4000 deer skins, 2000 bear skins. . . . The boat left Pittsburgh on a June rise and after many vicissitudes reached New Orleans, where the cargo was sold at a profit." [15] Many other schooners were built for the Mississippi River trade.

Steamboats, the invention of Robert Fulton of Little Britain, Pennsylvania, were not an important factor in transportation of farm produce, even in the Pittsburgh area where they were used most. The Ohio is navigable for its entire length, the Allegheny for about 200 miles (for small steamers) and the Monongahela for about sixty miles.

The first steamboat in western waters was the "New Orleans," a stern-wheeler built in Pittsburgh by Fulton and Livingston and launched in March 1811. This and other steamboats built by Fulton at Pittsburgh went down stream well enough but were not able to ascend the river. The first steamboat able to buck the current, the "Enterprise," was launched in 1815. After 1816 steamboats made regular trips on the Allegheny, Monongahela and upper Ohio. They burned wood; coal was not used until after 1830. Farmers used steamboats very little; produce could be transported much more cheaply on flat-boats.

A few steamboats plied parts of the Delaware, Schuylkill and Susquehanna. These and other eastern rivers are too shallow and have too many falls to be suitable for steamboat navigation. The first iron steamboat in the United States, the "Codorus," was launched at York in 1825 for traffic on the Susquehanna. It drew only twelve inches of water. Other light boats of this type, of 100 to 300 tons burden, were built for river navigation. These had but a brief period of usefulness. Water transportation of farm produce mostly ceased after 1840 when railroads began to provide freight service that was quicker and cheaper.

TRAILS

Before roads were built, narrow trails served as routes of communication on foot or horseback. Often these followed closely ancient paths traversed for centuries by buffalo or Indians. Buffalo were the first trail builders. Many so-called Indian trails, now important highways, merely followed paths beaten by buffalo in their annual migrations.

"The three great overland routes from the Atlantic seaboard," says Archer B. Hulbert, "were undoubtedly first opened by the buffalo. . . . One of these was from the Potomac through southwestern Pennsylvania to the headwaters of the Ohio (National Pike). . . . There were lesser thoroughfares which, though latterly known as Indian trails, were undoubtedly paths of buffalo. One of these was the famous Kittanning Path from the headwaters of the Juniata to the Allegheny—the route of the Pennsylvania Railroad across the Alleghenies (William Penn Highway). Another was the old trail through Carlisle and Bedford later known as Forbes' route to Pittsburgh (Lincoln Highway). . . . The buffalo, because of his sagacious selection of the most sure and most direct courses, has influenced the routes of trade and travel of the white race as much, possibly, as he influenced the course of the red men in earlier days. He 'blazed'—with his hoofs on the surface of the ground—the course of many of our roads, highways and railroads."[16]

Indians had no roads, only paths or trails. Ordinarily these were so narrow that they had to be traveled single file. They were never widened or improved; often they were "blind"—overgrown and difficult to follow. The main arteries of the Indian trail system followed closely the great rivers—the Delaware, Susquehanna, Allegheny and upper Potomac. Most large Indian villages were located at the forks of these streams and were connected by trails; as the "Forks of the Delaware" at Philadelphia and Easton; the "Forks of the Susquehanna" at Sunbury; and the "Forks of the Ohio" at Pittsburgh.

The more important Indian trails were: (1) Nemacolin's Trail, from Will's Creek on the Potomac to Brownsville on the Ohio. In 1758 it was widened into Braddock's Road, later the National Pike. The Baltimore and Ohio Railroad closely parallels this course. (2) A trail from the Susquehanna to the Ohio river, via Shippensburg and Bedford, now known as the Lincoln Highway. (3) The Kittanning Path, from Paxtang up the Juniata and across the Alleghenies to Kittanning and the Ohio—the general location of the William Penn Highway. (4) A trail from near Wyalusing on the north branch of the Susquehanna south to Northumberland, then to Huntingdon on the Juniata, thence via Woodcock Valley to the Potomac. (5) A trail from the junction of Bald Eagle Creek with the west branch of the Susquehanna to Bedford, where it joined the preceding trail.

Most Indian trails were only two or three feet wide. The whites gradually widened them for horseback travel and blazed the trees on each side. A widened trail was known as a bridlepath. Men traveled horseback; women rode behind them on pillions—pads or cushions attached to the rear of the saddle and strapped to the horse. Side-saddles did not come into use until after 1850. For long journeys the "ride and tie" system—each person alternately riding and walking—was common.

Before roads were built, overland transportation of farm produce was by horseback. Butter, poultry and other products were carried to market towns in wallets or panniers slung across the horse's back.

Long distance transportation was by means of pack horse trains which often were a cooperative neighborhood enterprise. Joseph Doddridge describes those which traveled from southwestern Pennsylvania to Philadelphia about 1763:

"The acquisition of the indispensible articles of salt, iron, steel and castings presented great difficulties to the first settlers of the western country. . . . Every family collected what peltry and fur they could obtain throughout the year for the purpose of sending them over the mountains for barter. In the fall of the year, after seeding time, every family formed an association with some of their neighbors for starting the little caravan. A master driver was selected from among them, who was to be assisted by one or more young men and sometimes a boy or two.

"The horses were fitted with pack-saddles, to the latter part of which was fastened a pair of hobbles made of hickory withes. A bell and collar ornamented their necks. The bags provided for the conveyance of the salt were filled with feed for the horses; on the journey a part of this feed was left at convenient stages on the way down to support the return of the caravan. Large wallets, well filled with bread, jerk, boiled ham and cheese furnished provisions. At night, after feeding, the horses . . . were hobbled and the bells opened (unstuffed) . . ." [17]

Pack horses walked single file, the foremost being lead by the caravan captain. The halter of each horse was tied to the pack saddle or tail of the horse in front of him. At the rear was a driver who checked on the adjustment of packs. Two men could handle twelve to fifteen horses. Ponies were preferred to large horses for use on mountain trails. The customary load was 180-200 pounds. Live calves, pigs or sheep might be carried in this way. The usual load of grain was three bushels. When grain was converted into whiskey a pack horse carried two kegs, one on each side. The average speed was fifteen miles a day.

Pack horse trails were not always beaten routes. Sometimes there were several alternate paths, especially in rough or swampy land. Detours had to be made around fallen trees or branches which blocked the narrow path, since little or no provision was made by the provincial or local government for keeping trails open.

After 1750 the main routes westward were crowded with pack horse trains. The terminus of wagon traffic was Carlisle, where goods were transferred to the backs of ponies who traversed the several bridle paths that converged at that point. "It was not an uncommon sight," says George H. Morgan, "to see as many as five hundred pack horses passing the ferry [Harris'] going westward. . . . Where the bridle road passed along declivities or over hills the path was in some places washed out so deep that the packs or burdens came in contact with the ground and were frequently displaced." [18]

Pack horse transportation was expensive. In 1784 the cost of carrying a ton from Philadelphia to Erie was $249. In 1794 the transportation charge from Philadelphia to Pittsburgh was $10 per hundred pounds.

Pack horse transportation reached its zenith about 1790; thereafter roads were built and wagon transportation gradually supplanted it, to the burning indignation of pony drivers. "Many still remember," said John F. Watson in 1830, "seeing the first wagon arrive at Carlisle and the indignation it excited among the packers, as likely to ruin their trade. Even the widening of the roads, when first ordered, offended them." Pack horse men fought bitterly against the transition to wagons not only because their business was endangered but also because their ponies were too small for use on wagons. For a number of years there was open feud between them and drivers of wagons and stage coaches; each sought to make life miserable for the other. Stage drivers took special delight in crowding ponies off the road; pack horse drivers retaliated with fists, stones and clubs. But the march of progress could not be stayed. Pack horses were used until 1840 in sparsely settled parts of northern Pennsylvania where there were no roads, then they passed from the scene.

ROADS

As soon as the number of settlers justified it, trails were broadened into roads. These came very slowly, not only because waterways determined the location of most of the early settlements but also because their cost was prohibitive in a sparsely settled and heavily wooded country. Another deterrent was the tardy introduction of wheeled vehicles. The early Dutch and Swedes built no roads. Most of their travel was by water but there were a few neighborhood trails through the woods.

Not until the English came was any serious consideration given to road building. In 1675, when Pennsylvania was under the authority of the Duke of York, a court held at New Castle ordered, "That some convenient way bee made passable between Towne and Towne in this River, The Manner of doeing itt to be ordered by the Respective Corts." [19] In 1678 the Court at Upland ordered, "Every p'son should wthin the space of twoo months, as far as his Land Reaches, make good and passable wayes from neighbor to neighbor, wth bridges where itt needs, To the End that neighbors on occasion may come together. Those neglecting, to forfeit 25 gilders." [20] Another order instructed: "The highways to be cleaned as forthwith, viz: The Waye bee made clear of standing and lying trees, at least ten feet broad, all stumps and shrubbs to be close cut by ye ground, the trees marked yearly on both sides." Manifestly these so-called highways were merely slightly broadened but still rough trails.

Under the Duke of York the Governor and Council were authorized to build and maintain roads. The first road in Pennsylvania was the "King's Path," later known as the "King's Highway," built in 1677 from New Castle toward Chester and the site of Philadelphia. At the first court held in Philadelphia, on January 11, 1682, the Grand Jury presented that "the King's Road from Sculkill through Philadelphia to Neshameny creek may be marked out and made passable for horse and carts, where needful."

All the early roads laid out by order of the Provincial Council were called King's Highways. After 1700 other roads were laid out by order of county courts under an act passed that year entitled, "An Act to empower Justices in each County to Lay out and Confirm all Roads except King's Highways and Public Roads." The minutes of the Council for June 3, 1686, record, "A Petition Relating to highways was read, upon wch the Councill agreed y^{t} there should be a Sett time appointed by y^{e} Councill to Inspect all y^{e} Business relating to y^{e} Highways, and to Order y^{t} y^{e} Roads be Laid out in y^{e} most proper and Convenient Places within this Province." [21]

A number of King's Highways were laid out in accordance with this action, all running from Philadelphia to other settlements along the Delaware. In August 1700 the Council ordered that there be laid out "the King's Highway or Publick Road & the Bridges from y^e town of Philadelphia to y^e falls of the Delaware [Trenton]." The purpose was to bring the settlements in west New Jersey into the marketing radius of Philadelphia.

When a road was opened there was no assurance that it would be kept open or remain in the same location. An abutting property owner could plow and crop the ground or fence off the road, according to his whim. Most early roads were very crooked not only because they followed contours, with little if any cuts or fills, but also because they followed line fences. Many settlers had already fenced their farms before roads were built and would not willingly allow a road to bisect their fields. In 1688 William Penn desired Governor Blackwell that "pains be taken of the roads and highways of the county [Bucks] that they be straight and commodious for travellers, for I understand they are turned about by the planters, which is a mischief that must not be endured." [22]

The "Queen's Path" from Philadelphia to Chester was established in 1706; the "Old York Road" in 1711 and its branch to Doylestown and Easton in 1722; the "Old Conestoga Road" from High Street, Philadelphia, toward Lancaster in 1721, but only as far as Brandywine; and the road from Easton to Reading in 1755.

In 1718 the Provincial Council received "A Peticon of several of the Inhabitants of & near Conestogoe [Lancaster] setting forth the Great necessity of a Road to be laid out from Conestogoe to Thomas Moores & Brandywine," [23] but nothing was done about it then. After thousands of settlers had poured into that rich farming country there was renewed pressure for a road from Lancaster to Philadelphia, "till it falls in with the high road in the County of Chester." The Lancaster road was completed in 1733 and was declared to be a King's Highway.

Heavy traffic soon brought the Lancaster Road into such disrepair that farmers of Lancaster, York and adjacent counties began to market their produce in Baltimore. In 1743 James Logan, Provincial Secretary, wrote to Governor Thomas Penn that the settlers around Hanover and York were about to open a road to Baltimore "because of ye shortness of ye cut, not being above 45 miles; from Philadelphia they are about 90 miles, besides ye Ferriage over ye Susquehannah."

In 1772 the farmers of Lancaster County sent a petition to the General Assembly setting forth "that the Inhabitants of the Western Counties labour under the greatest Difficulties in transporting the produce of the Country to the City of Philadelphia, the Grand Mart of the Province, owing to the extreme badness of the Roads, which are sometimes almost impassable, and at all times dangerous and attended with great Delays and Losses; That a great part of this Produce is already lost to the City of Philadelphia; That a Turnpike Road would soon restore the valuable and increasing trade of York and Cumberland Counties and secure the trade of Lancaster County and be an easy Mode of transporting the Products, not only of those Counties, but of the newly settled Country to the Metropolis of our Province." [24]

The General Assembly did nothing to satisfy this plea. In 1774 it received an even more urgent petition from the same source stating that "on account of the Inattention paid to public Highways, large Quantities of Grain, Flaxseed, Hemp, Iron and other Articles of Trade are daily conveyed to Baltimore and other Parts of Maryland which otherwise would naturally be sent to the Philadelphia Market." Whatever inclination the Government may have had at that time to respond to this appeal was lost in the welter of the Revolution. Not until the building of the Lancaster Pike, in 1795, was an adequate hard-surface road between that point and Philadelphia realized.

Except the Cumberland Valley route, roads west of the Susquehanna were built a generation or more later. Early Indian traders in western Pennsylvania used the road from Philadelphia to Harris' Ferry, thence by bridle path to Will's Creek on the Potomac, thence by Indian trails to the Forks of the Ohio. Braddock's Road, which was built originally in 1755 by George Washington for military purposes, followed the general route of Nemacolin's Path from Will's Creek, near Cumberland, Maryland, to the Forks of the Ohio. It was only twelve feet wide and was of necessity hastily built and was satisfactory only for emergency use.

Forbes' Road, now part of the Lincoln Highway, was built in 1758 by Colonel Bouquet to expedite the march of General Forbes against Fort Duquesne. It connected Raystown (Bedford), then terminus of the route to Philadelphia, with the Forks of the Ohio. For many years it was the main route across the mountains. At the beginning of the Revolution it was known as "The Pennsylvania Road." Later it was improved by the state and called the "Chambersburg-Pittsburgh Road."

On assuming authority in his province William Penn put into effect the road policy then prevailing in England. Colonial legislation with respect to roads was based on an Act of Parliament in the reign of Henry VIII which assigned to individual parishes responsibility for building and maintaining roads within their respective boundaries and authorized local governments to require property owners to work on the roads. Penn's law read, "The County Court . . . shall yearly choose and appoint three overseers, at least, for the highways . . . Such Overseers shall summon in all the Inhabitants . . . to Work at the Making of all highways and bridges." [25]

The wretched condition of roads throughout the colonial period and for some years thereafter was due mainly to this policy. Occasionally the Provincial government made small appropriations for certain roads, especially those used for military purposes, such as Braddock's Road, but this was a departure from the general policy of local responsibility. It was inevitable that there should be great diversity in construction and upkeep. County and township governments were without power to levy and collect road taxes; they were wholly dependent on the compulsory road work required of all taxables. A man could not be compelled to work on the roads more than six days annually and this must be done under the direction of road overseers. Little more than temporary construction and repairs was possible under this method. Perhaps it was the most expedient procedure under pioneer conditions when there was little wealth and the population was mostly farmers, but it was very inefficient.

In 1762 the General Assembly discontinued the compulsory work provision of the road law of 1700 and authorized road supervisors to employ men to work on highways.[26] This effected little improvement, for farmers still had the option of "working out" their road tax and most of them did. This practice was continued in certain parts of the state until 1911 when it was abolished by Act of General Assembly.

Under the road law of 1762 responsibility was placed not on county and township governments, as previously, but on township supervisors of highways elected by the people, not appointed by the County Court. This was a step backward. Many townships were so poor that they were unable to build and maintain respectable roads, or were not so inclined. This was especially true of townships whose main roads were used more by strangers passing through than by local citizens. There developed a demand for state aid, especially in the sparsely settled western and northern parts of the state.

In 1771 the General Assembly designated the Delaware and Lehigh rivers and parts of the Susquehanna and Juniata as public highways and appropriated money to dredge the Susquehanna. In 1782 the Monongahela and Youghiogheny were similarly designated.

The policy of placing responsibility for building and maintaining roads solely on local governments resulted in desperately poor highways, even those radiating from Philadelphia. At some seasons of the year they were practically impassable. Few streams were bridged; fords were difficult and often dangerous; ferries, which were privately owned, were few and crude. Rails were piled by the roadside for use in prying wagons out of the mud. Not infrequently drivers took down fences and made new routes across fields; many roads had several tracks at certain points.

The wretched condition of even the main roads of Pennsylvania as late as 1796 is pictured by a European traveler, Isaac Weld: "The road from Philadelphia to Baltimore exhibits for the greater part of the way an aspect of savage desolation. Chasms to the depth of six, eight, or ten feet occur at numerous intervals . . . Coaches are over-turned, passengers killed and horses destroyed. . . . In winter sometimes no stages set out for two weeks . . . The driver had frequently to call to the passengers to lean out of the carriage, first on one side then on the other, to prevent it from over-turning in the deep ruts."

In 1792 Jonathan Tyson, a farmer of Abingdon, saw "thirteen lime wagons at a time stopped on the York road, near Logan's Hill, to give one another assistance to draw through the mire, which was to the horse's knees." In the spring of 1800, when the frost had left the ground, "four hours were consumed in travelling by horseback from Philadelphia to Germantown, the saddle or team-horse sinking to the knees and deeper in many places." When such conditions prevailed on main roads, what must they have been in more remote districts! There a teamster who was stalled in the mud might have to wade in and unhitch his team and spend the night by the side of the road until assistance came.

There was some improvement after 1800, especially on roads that were turnpiked, but most dirt roads remained hazardous. In 1810 Margaret Van Horn Dwight, a prim New England spinster, recorded in her diary her experiences on the present Lincoln Highway: "We found the roads bad past description—worse than you can possibly imagine. Large stones & deep mud holes every step of the way. We were obliged to walk as much as we possibly could as the horses could scarcely stir the waggon. . . . We overtook an old waggoner whose waggon had got set in the mud & I never heard a creature swear so . . . I could but wonder at the patience and forbearance of the Almighty, whose awful name was so blasphem'd . . . We have only come eight miles today & I have not been in the waggon." [27]

In swampy places, especially on the frontier, "corduroy" roads might be substituted for mud. Logs were placed three or four feet apart lengthwise of the road and smaller logs or poles ten or twelve feet long laid on these, touching each other. They would bear heavy loads, even when partly afloat, but were very rough. Said Henry Tudor, "They afford a person troubled with indigestion an excellent opportunity for the due secretion of the gastric juice. These anti-bilious communications are designated corduroy roads; and I think the unhappy wight who has traveled over them would never be inclined to wear a garment made of the stuff."

Colonial roads were a heavy economic handicap to the farmer. Even those who depended mainly on water transportation for getting their grain to market were limited by the poor roads that lead to the streams. Until after 1800 most back-country roads were merely opened, not constructed. They were narrow passage-ways through the woods, ten to twenty feet wide, from which the trees had been cut and the logs rolled away, leaving stumps and brush. Trees and limbs broken off by snow and wind fell across the road; the axe had to be used on almost every trip. Swampy places or "hog-wallows" were crossed on logs laid crosswise with a little soil on top of them.

Many colonial roads were a general route rather than a way. They might be a mile wide at certain places, several paths being used, some on high ground and others on low ground according to season and condition. Little care was taken to avoid steep inclines; the road led up hill and down. During the greater part of the year it was impossible to haul loaded wagons over them. Three days were required for an ox team to haul a load of grain twenty-five miles to market. Two yoke of oxen were required to haul what would be considered today a small load for one team of horses. It cost as much, or more, to move grain to market as to produce it. Wheat could not be transported profitably by land for more than fifty to seventy-five miles and corn twenty miles. This is one reason why so much corn and rye, especially that produced west of the Alleghenies, was converted into whiskey.

Soon after the close of the Revolution the forward-looking young Commonwealth embarked upon a program of road construction that made it foremost among the states in this respect. Tench Coxe asserted that from 1790 to 1793 more money was expended in Pennsylvania for the improvement of roads and rivers than had been devoted to this purpose from 1681 to 1790.[28] Main highways in the southeastern counties were widened and graded and roads were opened west of the Susquehanna.

STATE AID

The year 1784 ushered in a new era in road building. It marked the close of the long period when the entire burden of road construction and maintenance fell on local governments, and the beginning of state aid. The newly awakened interest of the state in good roads was prompted by self-interest—to draw to Philadelphia the trade of the western counties, which were mainly agricultural. A large proportion of the farm produce of Lancaster, York, Cumberland and other south-central counties then went to Baltimore. In 1772 it was stated that the farm products of these three counties were of greater value than those of all other counties of the province together, and that in the fall of 1771 there were shipped to Baltimore by water 9000 bushels of wheat from settlements on the Juniata alone.[29]

Philadelphia merchants felt, and justifiably so, that this business should go to the capital city, not to enrich a rival metropolis in another state. Philadelphia was anxious, also, that the trade of southwestern Pennsylvania should come to it rather than be diverted down the Mississippi to New Orleans for trans-shipment to eastern markets, the West Indies and Europe. By 1790 the four counties west of the Alleghenies—Washington, Fayette, Allegheny and Westmoreland—had a population of 63,518. The most eligible route for migration to the far west was in Pennsylvania, through the gateway of Pittsburgh. For these reasons the state abandoned its century-old policy of exclusive local responsibility for roads. In 1789 the "Society for Promoting the Improvement of Roads and Inland Navigation" was organized at Philadelphia and in 1791 this organization presented to the General Assembly a comprehensive program for building roads and canals.

In 1785 the General Assembly appropriated £2,000 for building a state highway from Cumberland County to Pittsburgh, partly along the route of the old Forbes' Road. Both Braddock's Road, built in 1755 and Forbes' Road, built in 1758, then were overgrown with brush and in disuse. In 1786 a second state highway, from Lehigh Water Gap to the Susquehanna in Northumberland County, was authorized. In 1794 the legislature authorized a highway from Reading to Presque Isle (Erie).

In the years immediately following, several other state highways were built; from 1791 to 1820 there was a flood of state appropriations for roads. After 1820 state aid dwindled and in 1845 it ceased altogether; this was the period of turnpike building during which the state not only chartered private turnpike companies to build roads but also subscribed heavily to their stock. Early state highways were built but not maintained or controlled by the state, although some appropriations were made for the repair of state-built roads in sparsely settled districts; control, however, remained with county commissioners.

The first wagon-load of goods taken over the Alleghenies was hauled in 1789 by John Hayden, from Hagerstown to Brownsville, a distance of 140 miles. This was an historic event. The round trip required one month. Four horses were used to haul about one ton; the charge was three dollars a hundred pounds. The road was so steep in places that great tree limbs were tied to the rear of the wagons to drag on the ground and serve as a brake.

Until after 1800 there were no bridges, not even over large rivers; fords and ferries had to suffice. Among the earliest bridges was one over the Schuylkill at Philadelphia, over the same river at Reading, over the Lehigh at Bethlehem, and over the Delaware at Easton. The "Schuylkill Permanent Bridge" at Philadelphia was completed in 1805; it was one of the many achievements of the Philadelphia Society for Promoting Agriculture. Previously, these rivers were crossed on privately owned ferries, often operated at exorbitant rates. There was a ferry over the Schuylkill at Market Street as early as 1685. Harris' Ferry (Harrisburg) and Wright's Ferry (Columbia-Wrightsville) across the Susquehanna began operations in 1735; Devore's Ferry across the Monongahela about 1770, and Pittsburgh ferries about 1770.

Crossing rivers by ferry was a hazardous undertaking when they were "fresh" or full of floating ice. John F. Watson tells of a traveller who "had actually to remain there [Harris' Ferry] nine days to get even a chance to pass over amidst the driving ice. When he did start the boat, which had twenty inches of ice frozen to its bottom, became an unmanageable clump among the floating masses and drove down the stream some miles before they could effect a landing."[30]

A more comfortable crossing at Harris' Ferry was made by F. Cuming in 1807: "The large flatboat was worked by nine stout men with short setting poles shod and pointed with iron to break the ice and stick (or set) on the bottom. Only one of the crew set or pushed on the upper side while eight set on the lower side to keep the boat from being forced by the current against the ice, while a tenth steered with a large oar behind. A channel for this purpose had been cut through the ice and was kept open . . . In twenty-two minutes we were landed on the western shore."[31]

Small streams were forded, often at great risk. In 1810 Margaret Van Horn Dwight recorded in her diary, "A waggoner last week with four horses, was drowned crossing a creek [a tributary of the Juniata]. He was advised by those who were by not to venture & answer'd 'he would be damn'd to hell if he did not cross it'—he made the attempt & in a few minutes was sent into eternity & probably to that awful place." Until after 1800 many foot travelers crossed smaller streams by balancing themselves precariously on an "Indian bridge"— a tall tree cut down so that it fell across the stream from bank to bank.

By 1800 most of the main roads, including state-built roads, were in deplorable condition, especially those used most by migrants to the West. Settlers in northern and western Pennsylvania addressed numerous petitions to the General Assembly praying for relief and urging state aid. The time was ripe for another forward movement in highway construction. This came with the turnpike era, 1792-1830.

TURNPIKES

In the latter part of the eighteenth century the science of road building, neglected since the Romans, was redeveloped in Europe, especially by Telford, Metcalf and Macadam in Great Britain and by Tresaguet in France. Private turnpike companies were organized in England as early as 1663 to improve and maintain public highways. They increased rapidly after 1700. The success attending these ventures stimulated similar enterprise in America. Between 1790 and 1832 there was great activity in road building throughout Pennsylvania. Farmers were demanding better facilities for transporting produce to market; these demands were supported by residents of Philadelphia and other towns, who desired cheaper food.

In 1789 Richard Peters of Philadelphia urged the state government to make experiments on turnpiking the Lancaster Road with crushed stone.[32] Nothing was done. On April 9, 1792, the General Assembly passed an act incorporating the Philadelphia and Lancaster Turnpike

Company, the first such enterprise in America. The preamble recites: "Whereas the great quantity of heavy articles of the growth and produce of the country and of foreign goods which are daily transported between the city of Philadelphia and the western counties of the state require an amendment of the highway, which can only be effected by artificial beds of stone and gravel disposed in such a manner as to prevent the wheels of carriages from cutting into the soil, the expense whereof will be great, and it is reasonable to suppose that those who will enjoy the benefits of such highway should pay a compensation therefor, and there is reason to believe that such highways will be undertaken by an association of citizens if proper encouragement be given by the Legislature." [33] This action committed the state to a new policy—it transferred to private enterprise what had hitherto been considered an exclusively governmental function. This abrogation of its responsibility by government was a confession of weakness.

The Lancaster Pike was completed in 1794 at a cost of $465,000 or $7,500 per mile. It replaced the old Conestoga Road from Philadelphia to Lancaster and was sixty-two miles long. The cost of construction was derived from the sale of stock, which was much over-subscribed. In Philadelphia 2,276 persons sought to subscribe for a $300 share each but only 600, chosen by lot, secured stock. Similar enthusiasm was shown in Lancaster. There was some opposition to this particular enterprise and to the turnpike movement generally, the argument being that road construction and maintenance should be a governmental function, not a matter of private investment.

The corporation was required by its charter to construct the turnpike according to certain specifications and to maintain it in good repair. It was authorized to collect tolls in accordance with a prescribed schedule of rates. Provision was made for increasing tolls if dividends to stockholders did not reach six per cent and for lowering them if dividends were over fifteen per cent.

The Lancaster Pike was an immediate success. It was universally acclaimed as "a masterpiece of its kind." There were three large bridges; the "Permanent Bridge" over the Schuylkill at High (Market) Street, Philadelphia, which was privately constructed in 1800-1805; over the Brandywine at Downingtown, built by the turnpike company; over the Conestoga near Lancaster, privately built.

Regulations for Lancaster pike were published by the corporation and were changed from time to time. On January 22, 1796, it was ordered, "No wagon or other carriage with wheels, the breadth of whose wheels shall not be four inches, shall be driven along said road between the first day of December and the first day of May with a greater weight thereon than two and a half tons, or with three tons during the rest of the year." There were graduated increases in the permitted load up to ten inches of wheel width and three and a half tons. No more than eight horses could be used on a wagon.[34]

Tolls were collected at the end of every ten miles, as follows:

"For every score of Sheep	⅛ dollar
For every score of Hogs	⅛ dollar
For every score of Cattle	¼ dollar
Horse and rider, or led Horse	1/16 dollar
Sulkey, Chair or Chaise with one horse and two wheels	⅛ dollar
Chariot, Coach, Stage, Wagon, Phaeton or Chaise with two horses and four wheels	¼ dollar
Either of the Carriages last mentioned, with four hourses	⅜ dollar
Every Cart or Wagon whose wheels do not exceed the breadth of four inches, ⅛ dollar for each horse drawing the same.	
Every Cart or Wagon whose wheels shall exceed in breadth four inches and not exceed seven inches, 1/16 dollar for every horse drawing the same."	

Tolls were reduced still further when wider tires were used, but few wagons of that period had tires over four inches wide. Two oxen were considered equivalent to one horse.

The Lancaster Pike enjoyed a practically uninterrupted period of prosperity for more than twenty-five years. Dividends to stockholders were satisfactory. It was the most successful turnpike in America.

The success of the Lancaster Pike stimulated similar enterprises in other parts of the state. The Lancaster and Susquehanna Pike, from Lancaster to Wright's Ferry, ten miles long, was opened in 1803. It was another link in the route to Pittsburgh which passed through Gettysburg and Chambersburg. The Germantown and Reading Turnpike Company was incorporated in 1798 and began work in 1801. The turnpike from Germantown to Perkiomen, twenty-five miles, was completed in 1804 at a cost of $11,287 per mile.

Other companies chartered by the state built pikes from Lancaster to Harris' Ferry, chartered in 1796 and completed in 1815; Philadelphia to Trenton, chartered in 1803; Easton to Wilkes-Barre in 1805; Erie to Waterford in 1803; Sunbury to Reading in 1805. The Harrisburg and Pittsburgh Turnpike Company was incorporated in 1806 to build via Chambersburg and Bedford. In 1811 the state subscribed $150,000 toward its construction; this was begun in 1816.

In 1806 Congress authorized the construction of the National Pike from Cumberland, Maryland to the Ohio River by way of Uniontown, Brownsville and Wheeling. This followed part of the route of Braddock's Road. It was completed in 1818 and had very heavy travel. The eighty miles of this pike in Pennsylvania were not a toll road until the Federal government surrendered it to the state in 1835.

By 1821 the state had chartered 146 turnpike companies, mostly in the more populous districts of southeastern Pennsylvania. There had been built 1,807 miles of turnpikes, which were from three to 117 miles in length. In 1822 the Committee on Roads, Bridges and Inland Navigation of the Senate reported that turnpikes completed or in progress provided two stone roads between Philadelphia and Pittsburgh; a road from Philadelphia to Erie via Sunbury, Bellefonte, Franklin and Meadville; two roads from Philadelphia to the New York state line, one through Berwick the other through Bethlehem and Susquehanna County; and a stone road from Pittsburgh to Erie via Butler, Mercer and Meadville. The committee complacently remarked, "The completion of these pikes will afford facilities for traveling and transportation unequaled, as to extent, in the United States."

By 1832, when the turnpike movement was at its peak, the number of companies chartered was 220 and the completed and projected mileage was over 3,000. At that time approximately 2,400 miles of pike had been completed. A few companies were chartered after 1832, mainly as feeders to existing turnpikes, but the competition of canals and railroads put a damper on further construction. After 1832 more miles of turnpike were abandoned than constructed.

In 1806 the state adopted the policy of aiding certain turnpike companies, especially those in sparsely settled districts, by subscribing to their capital stock. By 1821 state subscriptions were $1,861,542 of the $6,401,474 then invested in turnpikes. In no case did the state subscribe to more than a third of the stock of any company. In rural districts farmers subscribed freely, not with the expectation of receiving large dividends but because of indirect benefits, particularly enhanced farm values and cheaper transportation.

Except for the Lancaster Pike and a very few others, the stock of turnpike companies was a poor investment. "None have yielded dividends sufficient to remunerate the proprietors," said Samuel Hazard in 1828. "Most of them have yielded little more than expenditures for repairs. Some have been abandoned." [35] During the five year period 1825-1829 the net annual earnings of the two most profitable turnpikes were: Philadelphia and Lancaster Turnpike, four per cent; Germantown and Perkiomen Turnpike, 4.8 per cent.[36] Thereafter earnings declined sharply.

In chartering turnpike companies the legislature specified in detail the width, grade, ditching and surfacing of the proposed highway and its maintenance. Most turnpikes were four rods wide, sometimes five or six. A crowned "artificial" stone road, eighteen to twenty-five feet wide, occupied the center of the right of way, with a "summer road" of natural soil on one or both sides. The stone used was that common to the area through which the road passed, mainly limestone, flint, granite, slate and gravel; of the 1,807 miles of turnpike built by 1821, more than 1,250 were of stone.[37]

Usually from nine to fifteen inches of crushed rock of graduated size were laid on a foundation of stones five to eight inches in diameter, with a surfacing of stone dust, gravel or coarse sand to serve as a binder. Where the pike crossed swampy land corduroy might be used. The cost of construction varied from $900 to $10,000 per mile. While turnpikes were not comparable in efficiency with modern highways, some of them were well built.

The explicit directions of the Legislature as to the construction and maintenance of turnpikes were not always observed. The state made no arrangement for inspection and for enforcement of charter provisions. The General Assembly received numerous complaints of the poor condition of certain turnpikes, due to negligence, lack of funds or fraud. In 1814 it appointed a commission to inspect the Erie and Waterford turnpike. The commission reported that the road was of "no harder substance than the natural soil of the land through which it passed" and that it had "many large mudholes and poor bridges."

Collection of tolls was a constant source of irritation. The word "turnpike" is derived from the gate or bar that was suspended across the road to stop the traveler until he had paid toll, after which the bar was turned, allowing him to pass. The main source of revenue was long-distance traffic. Local users often protested bitterly against the necessity of paying toll and used every possible means of avoiding doing so. In an effort to appease this opposition most turnpike companies found it expedient to grant privileges to certain travelers, such as those going to attend public worship, or funerals, or to take grist to mill. On some turnpikes all travel necessary in connection with the operation of a farm was exempt from tolls.

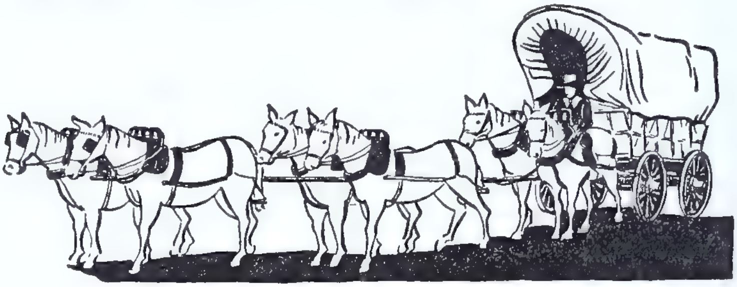
Tolls were high, sometimes almost prohibitive. In 1834 the Jersey Shore Turnpike Company completed a road from that point into Potter County. "The toll for each five mile section was twelve cents for a wagon, whether loaded or empty, with proportionate rates for carts, sheep and hogs. Since the road was sixty-nine miles long it cost $1.68 for a team; this was a large sum at that time." [38] By act of the General Assembly in 1824 the toll for every five miles on the state pike from Waterford, Erie County to the Susquehanna in Clearfield County was: "For every score of sheep, four cents; for every score of hogs, six cents; for every score of cattle, twelve cents; for every horse or mule laden or unladen, with his rider or leader, three cents; for every cart or wagon or other carriage of burden the wheels of which do not in breadth exceed four inches, four cents for each horse drawing the same."

Many ingenious schemes were used to avoid payment of tolls. "Most of the toll-gates were thrown open at ten o'clock at night because it would not pay the turnpike company to hire an extra man to collect toll after that hour. If the keeper chose to stay after that time he could do so at his own profit. In that case he would close the gate, hang a lantern on it and go to bed, and perhaps have to be called several times during the night to open the gate. Drivers had a grudge against an 'after ten' gate keeper. . . . Before market days [in Philadelphia] gate keepers were obliged to collect tolls all night and sometimes six or more teams would be lined up at a gate waiting to pay their toll . . . Those driving to or from church were not required to pay toll . . . On Sunday mornings they carried Prayer Books and held them up as they passed through the gate unchallenged, although they may have gone no further than the nearest roadhouse."[39]

Most of the bridges over large streams were built by corporations which were authorized by the Legislature to collect tolls; a few were constructed by turnpike companies. They were built of wood or stone; iron bridges were first used about 1850. Some of these old stone bridges, such as the one over the Conestoga at Lancaster, were masterpieces of masonry.

Turnpike construction declined rapidly after 1832 and practically ceased after 1840. By that time railroads had demonstrated their superiority over other means of long-distance transportation. Thereafter the chief usefulness of turnpikes was as feeders for canals and railroads. With greatly reduced traffic, even trunk line turnpikes found their revenue insufficient to keep the roads in repair. Many were abandoned. The Lancaster Pike struggled along until 1873, after which it was gradually sold or abandoned. The last twelve miles were sold in 1899, after over a century of service. Most turnpikes were taken over by state and local governments and maintained with public funds. With the advent of railroads Pennsylvania highways entered upon a period of neglect which continued until about 1900, when there was a revival of interest in good roads largely because of the introduction of the automobile.

Turnpikes were very expensive to maintain because of the necessity of employing many toll-keepers. In most cases the revenues were hardly sufficient to pay them; little or nothing was left for maintenance and improvement. But they served the transportation needs of farmers during the critical period when agriculture was passing from subsistence to commercial farming. They increased the value of farms and promoted a more satisfying country life. Only the main highways were turnpiked; the majority of farmers were still "in the mud."



HEY-DAY OF THE WAGONER

From about 1740 to 1840 farm produce not moved to market by water was transported in wagons. Most farmers east of the Alleghenies hauled their produce to Philadelphia or Baltimore themselves or floated it down the river in boats. Farm produce originating west of the Alleghenies was moved east mostly by men who made wagoning a business. Wagoning was rough and arduous work, but it was a picturesque aspect of Pennsylvania agriculture.

The heavy farm wagon known as a Conestoga—"the finest wagon the world has ever known"—was a product of Lancaster County. It was natural that these "ships of inland commerce" should have developed there, together with great Conestoga horses to pull them.

Previous to 1740 there were few wagons; sleds or heavy ox-drawn carts were used. Often these had solid wheels made of a thin cross-section of a large log; the hubs might be three feet from the ground. Conestoga wagons first appeared soon after German pioneer farmers had produce to sell, about 1725. According to William Douglas, more than 7000 were in use by 1749.[40] One of the earliest references to them was the advertisement of a tavern, "The Sign of the Conestogoe Waggon" which appeared in *Pennsylvania Gazette* for February 5, 1750. Previously they had been known as "Dutch waggons."

In 1753 Lewis Evans wrote, "The Oeconomy of the Germans has taught us the method of bringing produce to Market from the remotest part at a small expense. Every German farmer in our Province almost has a Waggon of his own . . . In the Spring and Fall of the year (when it is here a vacation from farming) they load their Waggon and furnish themselves with beasts and provender for the Journey. The Waggon is their Bed, their Inn, their everything. Many of them will come one hundred and fifty miles without spending one shilling." [41]

The early Conestoga wagon was somewhat like the English covered wagon. Soon, however, a distinctive type was developed to meet the needs of frontier travel over roads that were deeply rutted and often obstructed by stumps and rocks. Materials used in their construction made them practically unbreakable. The beds were longer and deeper than those of most wagons and sagged in the middle, so that if the load shifted it would be toward the middle, not against the end gates. Their boat-shape appearance gave rise to the popular designation, "ships of inland commerce" and later to "prairie schooners."

Conestoga wagons varied somewhat in size but were of the same general design. They were built by local wheelwrights and blacksmiths. Carefully selected trees of white oak, well seasoned and free from knots, were used for the frame, gum for the hubs, hickory for axle-trees and singletrees and poplar for the body. Although the wheels were only a few feet apart, the wagon bed was sixteen feet long. The wagons of farmers commonly had tires two and a half inches wide and one inch thick; wagons used in the trans-Allegheny freight service ordinarily had tires four inches wide, sometimes wider. The rear wheels were five or six feet high.

Six to eight shapely bows were arched over the body; they were lower near the middle of the body and projected, like a bonnet, at each end. The tops of the front and rear bows were about eleven feet from the ground. Over the bows was stretched tightly a stout white linen or hempen cloth, twenty-four feet long. The overhang of top at each end kept out rain and dust. Almost universally the body was painted bright blue and the running gear and sideboards a vivid red. With its white canvas top the Conestoga wagon was an arresting and patriotic sight—red, white and blue. Wheelwrights and blacksmiths, with pride of craftsmanship, expended their utmost skill upon them. [42]

On the Lancaster Pike locally-built wagons were known as "Conestogas" or "Turnpike Schooners" to distinguish them from the larger "Pitt Teams," which crossed the Alleghenies. They were supposed to carry thirty barrels of flour, or three tons. The usual freight charge from Lancaster to Philadelphia was $1.00 a barrel. Tolls on the trip amounted to $1.00 a ton.

The driver walked, rode the left wheel horse, or rode on the "lazy board." This projected between the front and rear wheels on the left side. The brake could be operated to advantage from it. Conestoga wagon drivers were chiefly responsible for introducing the American custom of passing approaching traffic on the right; previously the English custom of passing on the left had prevailed. The team was driven with a single "jerk line" which was attached to the "near" lead horse. A short jerk turned the team right; a long pull turned it left. Well trained horses turned right at the command of "gee" and left at the command of "haw."

"There were two classes of wagoners," said an eye witness of the scene, "sharpshooters and regulars. The regulars were on the road constantly and had no other pursuit. The sharpshooters, for the most part, were farmers who put their farm teams on the road in seasons when freights were high and took them off when prices of hauling declined. There was jealousy between the two classes. The regular drove his team about fifteen miles a day, while the sharpshooter could cover twenty miles or more. 'Line teams' were those controlled by an association or company. Many of the regular wagoners became members of these companies and put in their teams. The main object of line teams was to transport goods more rapidly; teams were stationed along the road at distances about fifteen miles apart and horses were changed, after the manner of stage lines." [43] Farmer wagoners also were called "militia." They commonly used four horses and carried feed for themselves and the team. Regulars used six horses and carried no feed.

Some prosperous regulars owned five to ten wagons. At the height of the wagoning era more than 10,000 were on the road between Philadelphia and the back country. Many well-to-do farmers of Lancaster County had one or more teams on the road part of the year. It was profitable business for them; this accounts, in part, for the bitter opposition of some of these farmers to railroads, which deprived them of this supplemental source of income.

There was intense rivalry between lines. A Line Wagon Company often was owned by the turnpike corporation and endeavored to secure a monopoly of freight hauling on that highway. It had warehouses along the way where repairs could be made, and maintained relays of teams at taverns that rebated to the company a percentage of their charges.

Conestoga wagoners were a fearless and often a roistering lot. They had to contend with lawless men who infested all the main highways then, lying in wait for the unwary and the weak. Even roads in the more thickly settled southeastern counties were unsafe for travelers until after 1800. According to Henry W. Shoemaker, the much-traveled "Grain Road," over which a large part of the wheat and flour of Lancaster and adjacent counties moved to tidewater for export, was "infested with highwaymen and robbers, since the wagoners carried plenty of money, especially on the return trip. Wagons loaded with grain traveled in convoys, with the stoutest and most daring man as the driver of wagon number one." The road from Gap, Chester County, to Newport, Delaware on Christiana Creek, was commonly designated as the "Grain Road," although much grain went to tidewater by other routes. A branch road ran from Newport to Wilmington, where there were many flour mills.

For many years Middletown, on the Susquehanna, was the terminus of river transportation of farm produce from central and northern Pennsylvania destined for Philadelphia. From that point it was hauled in wagons. "In 1790," says Julius F. Sachse, "over 150,000 bushels of wheat passed over the road for the Philadelphia market. This was exclusive of the large amount of grain raised in Chester and Lancaster counties which also was brought down the same road. At that time the cost of transporting a bushel of wheat from the Susquehanna to the Schuylkill was 2s. 6d. Each team carried 45 bushels and the trip required not less than ten days. It was estimated that 35,000 bushels of rye were consumed by horses in transporting these 150,000 bushels of wheat to market." [44]

When a wagoner arrived at the inn where he planned to spend the night he first went to the large barroom, spread out his pallet on an unoccupied spot on the floor, and had a "jigger" of rum. Then he ran his wagon into the tavern yard and tied his horses on either side of the tongue, on which was placed a feed trough; this saved the cost of stabling. The evening was spent in convivial life with others of his kind.

Thirty or more wagoners might spend the night at the same inn. Some of them slept out of doors, under their wagons, summer and winter.

By 1786 Conestoga wagon traffic across the Alleghenies, called "freighting," was well under way in spite of the bitter opposition of pack-horse men. Wagons of "Pitt teams" were larger and heavier than those used east of the Susquehanna. Six or eight horses were used and the load was three to four tons. Pitt teams traveled fifteen to twenty miles a day and made the round trip between Pittsburgh and Philadelphia in thirty to thirty-five days. They went in "strings" of twelve to thirty wagons, keeping together all the way not only for company but also for mutual assistance and protection against thieves.

Freight charges were high. "Before turnpikes were constructed," said Charles B. Trego, "it required a good team of five or six horses from eighteen to twenty-five days to transport 2,500 to 3,500 pounds from Pittsburg to Philadelphia. On the completion of the turnpike across the mountains the load was increased to 6,000 to 8,000 pounds and the trip was made in twelve to fifteen days."[45] In 1810 a western Pennsylvania farmer shipped 800 barrels of flour to Philadelphia, the freight on which was $2,400, or $3.00 per barrel. This made it impracticable to transport bulky material, as grain, and explains why most western Pennsylvania farmers turned their grain into whiskey.

At the peak of the wagoning era, about 1815, the number of Pitt teams crossing the Alleghenies was above 10,000. In 1817 Morris Birbeck reported, "About 12,000 waggons passed between Baltimore and Philadelphia and this place [Pittsburgh] in the last year, with from four to six horses, carrying from 35 to 40 cwt."[46] A string of Pitt teams was a sight long remembered:

> Many a fleet of them
> In one long, upward winding row.
> It ever was a noble sight,
> As from the distant mountain height
> Or quiet valley far below
> Their snow-white covers looked like sail.

Completion of the canal and railroad system from Philadelphia to Pittsburgh, in 1835, sounded the knell of wagoning. After 1840, railroads began to supplant other means of transportation, Conestoga wagons were relegated to use on farms and their drivers had to seek new occupations. It was a sad time for those who had been kings of the road for more than half a century. They congregated in taverns and dolefully sang:

> Oh, 'tis once I made money by driving my team,
> But now all is hauled on the railroad by steam.
> May the devil catch the man that invented the plan
> For it ruined us poor wagoners and every other man.

Inn keepers, wheelwrights, blacksmiths, hostlers and other worthies who had depended on the turnpike for a livelihood joined in the chorus.

Many farmers, also, viewed the change with dismay, for it meant the loss of a profitable market for horses and of supplemental income from hauling. It seemed to many like the end of "good times"; but it was merely the old order giving place to the new, as had occurred many times before.

A caravan of "Six-Horse Bell Teams" with gaudily decorated and mettlesome Conestoga horses, bells chiming musically, was a picturesque sight as it came down the pike. Long after Conestoga wagons had passed from the Pennsylvania scene they carried adventurous immigrants across the "Great American Desert," farther and farther west, until at last they reached the Pacific. They were the "covered wagons" of the pioneers of the West. By 1870 the Conestoga wagon was practically extinct. As for the hard-bitten wagoners, those ardent patrons of "Old Rye" and "Monongahela,"

> Their wagons are rust,
> Their bodies are dust;
> Their souls are with the saints—we trust.

CANALS

Canals played but a minor part in the development of Pennsylvania agriculture as compared with rivers, highways and railroads. Their period of usefulness was short, only about twenty-five years, from 1826 to 1850. Public enthusiasm for canal building reached its peak in 1826 when the state embarked upon an extensive system of public works, chiefly canals, costing many millions of dollars. During the canal-building era funds expended for internal improvements in Pennsylvania exceeded those of any other state. By 1840, when this ambitious program had hardly gotten well under way, railroads began to supersede canals.

The primary motive in this state program was to meet the challenge of New York and Maryland for control of trade to and from the West; and to maintain the supremacy of Philadelphia as the mercantile metropolis of America against its chief rivals, New York and Baltimore. This motive had been present before the canal-building era. In 1811 the General Assembly appropriated $825,000 to build roads and bridges having this particular purpose in view; $350,000 of this sum was used to assist private enterprise (turnpike companies) in the improvement of a highway between Harrisburg and Pittsburgh, $200,000 for a turnpike from Northumberland to Waterford, Erie County and $250,000 to build bridges across the Susquehanna at Harrisburg, Northumberland, Columbia and McCall's Ferry. It was confidently expected that these improvements would place Pennsylvania in a favorable position to dominate the western trade. By 1821 the state had contributed $2,373,542 to the building of turnpikes, canals and bridges out of a total of $10,350,000 expended for this purpose.[47]

As the limitations of turnpikes became more apparent, public interest was drawn to artificial waterways, supplementing natural water courses, as a possible solution of the transportation problem. The success of the Bridgewater canal in England, which was opened in 1761, and of subsequent European canals, stimulated similar activity in America. The chief limiting factor was expense, which was far more than for building roads. Private capital was inadequate except for building short feeder canals. Construction and control by the state seemed to be the only feasible procedure for trunk lines.

Some canals were built before the canal era of 1826 to 1840. Most of the early enterprises were directed toward the improvement of navigable rivers and all were built by private enterprise. In 1690 William Penn proposed that the Schuylkill and Susquehanna rivers be joined by a canal between their respective branches, Tulpehocken and Swatara creeks, and he had a survey made. His dream did not come true until more than a century later, in 1827, when the Union Canal was completed from the vicinity of Reading to Middletown, a distance of eighty-two miles. At Middletown it connected with the Pennsylvania Canal to Pittsburgh and at Reading with the works of the Schuylkill Navigation Company. The Union Canal was abandoned in 1885, after increasingly unprofitable operation. "It cost more than $6,000,000 which melted away from the estates of widows, orphans and capitalists all over the Commonwealth." [48]

In 1797 a canal was built around Conewago Falls on the west side of the Susquehanna, York County; and in 1813 a similar enterprise was completed at the same point on the east side of the river. Navigation of the Schuylkill for 108 miles from Philadelphia to Port Carbon was effected in 1826 by the Schuylkill Navigation Company, after eleven years of construction and partial use. Fifty-eight miles were canal and fifty were slack water navigation. Connection was made with the Union Canal at Reading. This canal was used to carry coal, lumber, iron and farm produce to Philadelphia. Between 1827 and 1838 the Lehigh Coal and Navigation Company improved eighty-four miles of that river between Easton and Stoddartsville with canals and slack water navigation.

The Lackawanna Canal, twenty-five miles long, was completed to Honesdale, Wayne County, in 1828, as an extension of the Delaware and Hudson Canal. The last important canal to be built by private enterprise was the Susquehanna or Tidewater Canal between Wrightsville and Havre-de-Grace, Maryland, a distance of forty-five miles. This was completed in 1840.

Improvement of rivers accompanied the building of corporation-owned canals. Navigation of Conestoga Creek from Lancaster to the Susquehanna, eighteen miles, was improved by building locks and dams, beginning in 1806. Codorus Creek from York to the Susquehanna was similarly improved in 1825. In 1817 the Monongahela Navigation

Company began to improve the river from Pittsburgh to the Virginia line by a series of locks and dams, so as to provide slack water navigation. This work was not completed until 1855.

Thus Pennsylvania was canal conscious long before the beginning of the state system of public improvements. "The time will come," said Robert Fulton, "when canals shall pass through every vale, wind around every hill, and bind the whole country in one bond of social intercourse." The general enthusiasm for canals found expression in the organization of The Society for Promoting the Improvement of Roads and Inland Navigation, at Philadelphia in 1789. Its members were drawn from all quarters of the state. On February 7, 1791, the Society memorialized the General Assembly in a comprehensive program of routes deemed most suitable for main highways and canals throughout the state, together with surveys and estimates of costs; and urged construction by the state. This document was largely responsible for the development of a state program of transportation.

Enthusiasm for canals reached its height in 1826 when the state embarked upon an ambitious program of "State Works," or "Internal Improvements." By 1835 an extensive system of state-built and state-operated canals, with connecting railroads was in operation. Its period of usefulness was brief; by 1840 even the most ardent canal enthusiasts had to admit the superiority of railroads over canals. By 1850 not a mile of state-owned canal remained.

The main incentive to building state works was the completion of the Erie Canal in 1825. This was an immediate and glittering success. It not only took practically all the western trade away from Philadelphia, because of greatly reduced freight rates, but also diverted a large volume of the farm produce of western New York which formerly had gone down the Susquehanna to Baltimore and Philadelphia. It soon made New York City the commercial metropolis of the nation, a distinction that had been held by Philadelphia for a century and a half. Farm produce from Ohio and westward, which had been going overland from Pittsburgh to Philadelphia at the almost prohibitive cost of $120 a ton, now went to New York City by way of the Erie Canal and Hudson River at less than half this cost.

The Erie Canal was a stinging blow to Philadelphia. At once that city took steps to regain its waning commercial prestige and to secure a share of the rich western trade now enjoyed by New York almost exclusively. A competing route to the West was planned. Most Pennsylvania statesmen did not recognize, or at least did not concede, the great advantage of New York in topography; they merely looked at the map and saw that the distance from the Ohio Valley to Philadelphia was 200 miles shorter than it was to New York.

Here and there dissenting voices were raised. Among these was the editor of the *Erie Gazette*. In 1825 he wrote, "The Erie Canal traverses a country so level that the height of its lockage does not much exceed the height of Lake Erie above tidewater. It passes along its entire extent a fine wheat country. . . . We will certainly fail to compete with the state of New York for the trade of the West. Nature has given her advantages in such competition which we cannot overcome."

There was delay in building the competing route, mainly because of agitation for railroads. On February 5, 1825, the State Senate appointed a commission to inquire into the practicability of building a railroad from Philadelphia to Pittsburgh. That year a pamphlet was published in Philadelphia entitled, "Facts and Arguments in Favor of Adopting Railways in Preference to Canals in the State of Pennsylvania." It argued that a railroad could be built in one-third the time of a canal, would cost only one-third as much and would be open the year around, whereas a canal would be open only about 220 days a year. Farmers of southeastern counties were almost unanimously opposed to the State Works program as impracticable, but canal enthusiasts carried the day. "An Act to Provide for the Commencement of a Canal to be Constructed at the Expense of the State and to be Styled the Pennsylvania Canal" passed the General Assembly on January 22, 1826, by a close vote, largely because of the dominance of Philadelphia.

Work on the project was begun immediately. The original plan was to construct the main line from Philadelphia to Pittsburgh first, then branch lines, as had been done with the Erie Canal. If this policy had been followed connection would have been made with the West several years sooner; but local pressure groups and legislative log-rolling resulted in the early construction of various laterals, thus delaying completion of the main line. This was 394 miles long. By 1842 the total length of the public works, including laterals, was 934 miles of which 117 were railroads and the remainder canals.

The main line comprised four divisions:

(1) Philadelphia and Columbia Railroad, 81.6 miles. This was opened in March 1834.

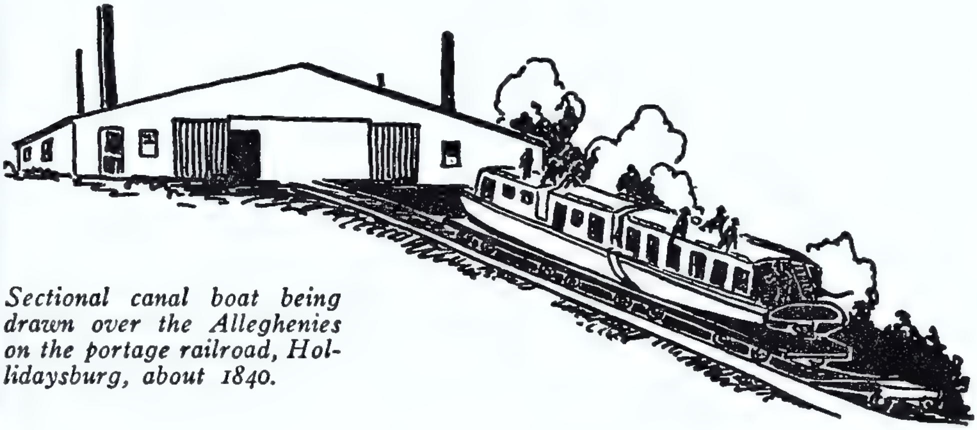
(2) Eastern and Juniata Division, 172 miles, a canal along the Susquehanna and Juniata rivers from Columbia to Hollidaysburg. This was opened in 1834.

(3) Allegheny Portage Railroad, from Hollidaysburg to Johnstown, 36 miles. A rise of 1,378 feet was surmounted by the use of ten straight inclined planes. Canal boats were loaded on cars and drawn up and down these planes by stationary engines and endless wire cables. This was the first conquest of the summit of the Alleghenies by other than pack horses or wagons. It was a remarkable engineering achievement. The railroad passed through a tunnel 9.01 miles long; this was the first tunnel built in America. The Portage Railroad was opened in 1832.

The extension of the Pennsylvania Railroad to Pittsburgh, in 1852, rendered the Portage Railroad obsolete.

(4) Western Division, a canal from Johnstown to Pittsburgh, 104 miles, utilizing the Conemaugh, Kiskiminetas and Allegheny rivers. This was opened in 1835.

Canals on the main line were twenty-eight feet wide at the bottom, forty feet wide at the water line and four feet deep. The locks were ninety feet long and fifteen to seventeen feet wide. In the summer of 1835 passenger travel from Philadelphia to Pittsburgh by the State Works was made in three and a half days.



Sectional canal boat being drawn over the Alleghenies on the portage railroad, Hollidaysburg, about 1840.

Proponents of the State canal system based their financial estimates on the brilliant success of the Erie Canal; they were sanguine that the income would provide "relief from all taxation and ultimately furnish an ample fund for education and for the extinction of the public debt." [49] The facts were quite the reverse. The total cost of the system during the fourteen years of state ownership was $33,464,000 and the gross revenue was $32,505,000, most of which was used for operation expense. The public works were sold in 1857 and 1858 for $11,000,000. The total financial loss to the state was $57,824,000. [50]

Part of this loss may be attributed to corruption in the use of public funds and to inefficient management by political appointees, but most of it was due to the fact that the system was completed too late to compete successfully with the Erie Canal, which had held a virtual monopoly on western trade for nine years. Moreover, freight rates on the Pennsylvania Canal were higher than on the Erie Canal, which had an easier route and on which no transfers were necessary, as there were at Hollidaysburg and Columbia.

Governor Porter was the first prominent official to admit publicly that the State Works were a failure. In his message to the General Assembly on January 8, 1840, he revealed that the average annual revenue between 1835 and 1840 had exceeded expenditures by only $139,000, which was but a fraction of the $1,200,000 required to pay the annual interest on money borrowed by the state to build the works. Pennsylvania was brought to the verge of bankruptcy by this ill-conceived and poorly executed enterprise. On June 25, 1857, the main line was sold to the Pennsylvania Railroad for $7,500,000. Next year the lateral lines were sold to the Sunbury and Erie Railroad Company for $3,500,000; later these became part of the Pennsylvania Railroad system. Thus terminated a disastrous experiment in public ownership of transportation facilities.

There was something on the credit side, however. Although Pennsylvania never regained the western trade it had lost to New York, the public works system did benefit the state greatly, especially its agriculture. It reduced the cost of transporting farm produce from southwestern Pennsylvania to Philadelphia from $120 a ton to $30. It promoted trade and intercourse and the development of natural resources. Feeder canals cut the cost of transporting farm produce throughout central and western Pennsylvania.

Most of the canals on which freight boats and passenger packets once plied now are dry and almost obliterated by vegetation. A few still carry water and are used for recreation. Here and there are crumbling remains of locks and occasionally the skeletons of canal boats. The Pennsylvania Canal system was an error in judgment, not in motive. The same benefits could have been secured, at less than a third of the cost, if the advocates of railroads had prevailed in 1826.

RAILROADS

During the years when public excitement over canal building was at its height a far superior method of transportation was being developed. Many experiments in railroad building were conducted before 1800. In 1794 Oliver Evans of Maryland predicted: "The child is already born who will travel from Philadelphia to Boston in a steam wagon." He was regarded as a wild-eyed visionary.

Pennsylvania pioneered in railroad construction. Between 1809 and 1830 several privately-owned short tramroads—fore-runners of railroads—were built. They were used to haul coal, iron, stone and other industrial products. They were not common carriers. Most of them were operated as feeders to canals. The cars were drawn on wooden rails by horses; the rails were four inches square and were reinforced with strips of iron spiked to them. The first tramroad in Pennsylvania was a nine mile road to a coal mine at Mauch Chunk.

The first public carrier railroad in America for conveying freight and passengers was opened in New York in 1826. The Philadelphia, Lancaster and Columbia Railroad, commonly known as the Columbia

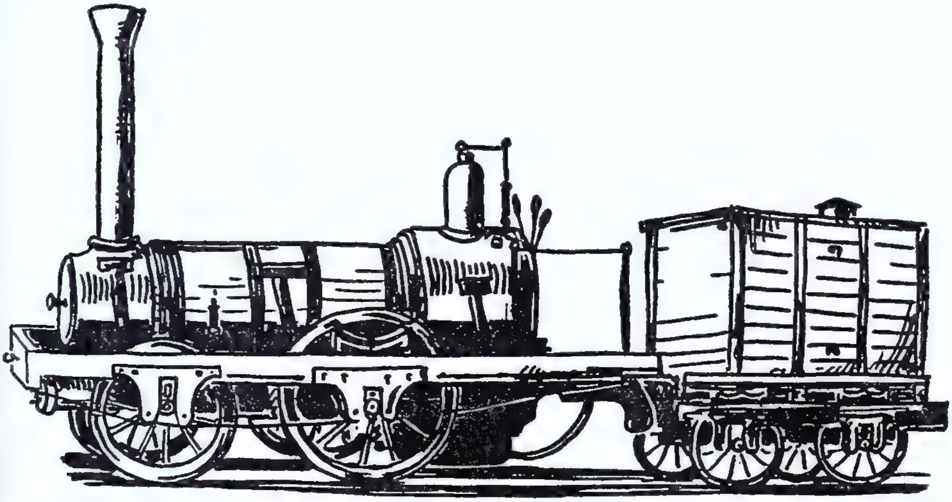
Railroad, was chartered March 1, 1832 and opened as far as Lancaster in February, 1834, as part of the state system of public works. The Philadelphia, Germantown and Norristown Railroad was incorporated in 1831 and opened as far as Germantown in 1832. The Philadelphia and Trenton and the West Chester Railroads were chartered in 1832 and the Philadelphia and Reading in 1833.

Agitation for building the Pennsylvania Railroad to Pittsburgh began in 1838 but the road was not chartered until 1846. In 1853 the Pennsylvania Railroad ran its first cars from Philadelphia to Pittsburgh, using the Portage Railroad of the public works system. The last link over the Alleghenies was completed in 1855, whereupon the Portage Railroad was abandoned. It is significant that the charter granted to the Pennsylvania Railroad by the state declares it to be a public highway.

The Philadelphia, Germantown and Norristown Railroad was the first common carrier in the state. It was an immediate success. For some years it was known as "the freight road of America"; in 1847 it carried more tonnage than the Erie Canal. The only railroads owned by the state were the Columbia and the Portage Railroads but the state subscribed freely to the stock of other roads.

The first cars on the Columbia Railroad were similar to stage coaches but somewhat larger. There was a side entrance door; the driver sat on an elevated box in front. Until 1837 they were propelled by horse power; nine hours were required to travel from Philadelphia to Columbia, eighty-two miles, the horses being changed every twelve miles. The metal-stripped wooden rails of early roads often came loose and curled up, making it necessary for the engineer to stop the train frequently to repair the track. The light iron rails used later on the Columbia Railroad were bolted to blocks of stone about 24 x 14 x 12 inches.

The first locomotive used on the Columbia road, the "Black Hawk,"



"Old Ironsides," first locomotive built by M. W. Baldwin of Philadelphia in 1832.

was built in England. Governor Wolf and a company of notables were on hand to see it make the first trip. They were disappointed; the train did not move until pushed by hand. In November 1832 the Baldwin Locomotive Works of Philadelphia tested its first engine, "Old Ironsides," on the six-mile road from Philadelphia to Germantown. The makers had so little faith in it that they inserted this advertisement in a Philadelphia newspaper: *"Notice:* The locomotive-engine (built by M. W. Baldwin of this city) will depart daily *when the weather is fair,* with a train of passenger cars attached. *On rainy days horses will be attached."* The shift to horses was necessary because there was no cab on the engine and it was inconvenient for the engineer to carry an umbrella.

Two years later, in 1834, Baldwin made his first dependable locomotive, the "Lancaster," which was put into service on the Columbia Railroad. It hauled nineteen loaded cars at twice the speed attained by horses. Thereafter locomotives gradually became established in public confidence. After 1840 they were used exclusively on the Columbia Railroad.

For several years wood was the only fuel used; farmers along the route found it a lucrative business to supply the railroad with cordwood. All trains stopped to "wood up" as well as to take on water. Although the smokestack was very tall, great clouds of sparks burned the clothes of both engineer and passengers and started numerous fires along the country-side; sometimes even the coaches were ignited. Davy Crockett's name for them, "Hell in harness," had considerable justification. Coal came into use about 1840.

The Columbia and other early railroads met bitter opposition from beneficiaries of turnpikes. "The great mass of the people," said A. K. McClure, "believed that the investment of state money in railways was little less than extravagant waste. . . . Mass meetings were held along the turnpike to protest against the introduction of railways. . . . In some instances senators and representatives were elected solely on that issue. Fortunately the progress of the railroad was so gradual that there was no violent destruction of the wagon transportation interests."[51]

The vested interests of corporation-owned canals, wagoners, stage coach proprietors and drivers, blacksmiths, wheelwrights, horse breeders, harness makers, inn keepers and others who derived their living from highways were vociferous in opposition to the new form of transportation. They argued that reasonably satisfactory facilities for transportation already had been provided and that it would be a grave injustice to permit a rival interest to deprive them of the fruits of their investment and labor. In 1834 a super-heated patriot rose in the General Assembly and thundered, "Is the House aware of the smoke and the noise, the hiss and the whirl, which locomotive engines, passing at the rate of ten or twelve miles an hour, would occasion? Even the cattle plowing in the fields or grazing in the meadows would view them with dismay. It would be the greatest nuisance, a complete disturber of quiet and comfort."

Many farmers were opposed to railroads on the assumption, which proved to be false, that they would ruin the market for horses. They also believed that if railroads resulted in a lower cost of distribution this advantage would be gained at the expense of agriculture. Some farm journals, however, warmly supported the movement. Drivers of Conestoga wagons, sensing the loss of their business, and some disgruntled farmers as well, congregated at taverns and sang lustily over their "Old Rye":

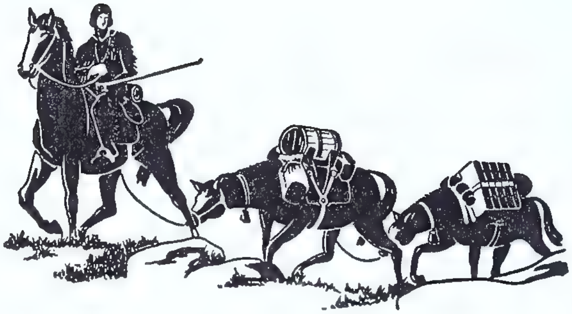
> May the devil get the man that first invented the plan
> To make a railroad or dig a canal;
> For they ruin our plantations wherever they do cross
> And they spoil our markets that you can't sell a horse.

One of the burning grievances of farmers against railroads in the early days was that they killed livestock and started fires. Priscilla Moore, a farmer's "relic" near Berwyn, had her favorite heifer killed in 1836 by one of the first locomotives used on the Columbia Railroad. Her application for compensation was denied. Greatly incensed, she rendered out all the tallow in the carcass and applied it to the rails near her home. No locomotive passed for twenty-four hours; one vainly tried to pass, until its water supply was exhausted. This feminine flanking maneuver soon brought the railroad to terms. After 1840 all railroads found it expedient to pay for livestock killed.

The damages, however, were not all on one side; when one of the early locomotives collided with a cow it had to be sent to the repair shop. In 1840 Frederick Marryat, an English traveler, recorded, "It is impossible to say how many cows have been cut to atoms by the trains in America, but the frequent accidents arising from this cause have occasioned the Americans to invent a sort of shovel attached to the front of the locomotive which takes up a cow, tossing her off right or left." This dexterous feat was accomplished at a time when trains tore along at the breakneck speed of ten to fifteen miles an hour. Fencing in the right of way was not practiced until after 1850.

In spite of the dire predictions of turnpike partisans, the benefits of railroads to agriculture were immediate and positive. Farm produce could be carried to market more quickly and arrived in better condition. Transportation charges were sharply reduced. Possibly the first farmer to have the temerity to use the railroad for transporting cattle was B. Herr of Lancaster County in 1835. As reported in a contemporary journal, "Had these cattle been driven to the city the time required would probably have been 6 or 8 days, besides the expense of a person or two to drive them—and they would have suffered in the flesh so much as to have required some time after their arrival here to recruit before they could be fit for slaughter. Now they appear perfectly fresh and arrived in one day from whence they started." [52]

Railroads brought about marked reductions in freight rates, from five to eight cents a ton mile to about one cent. The substitution of coal for charcoal in smelting iron, about 1840, made it possible to produce heavy iron rails. Short lines began to merge as trunk lines. This giant of transportation, successor to the canoe, ark, pack-horse, Conestoga wagon and canal, soon made its way into every corner of the state. It was a major factor in the transformation of Pennsylvania agriculture from subsistence to commercial farming and in the improvement of country life. For many years it seemed to be the last word in transportation, but the shriek of the locomotive drowned out the approach of the motor truck and airplane, which were to offer it stiff competition within a century.



Pack-horse train
crossing the Alleghenies, 1780.

XI

MARKETING

FOR THE first century and a half most farm produce except wheat was consumed on the farms where it was grown, but a steadily increasing surplus was sold, mainly for export. Prior to the Revolution there were few local markets. The only city was Philadelphia; Lancaster, York and Reading were small towns and Pittsburgh was a village. In 1800 Lancaster was the largest inland town, with a population of 4,292. There were many rural villages but most village dwellers, including the minister, doctor, lawyer, storekeeper, wheelwright, blacksmith, shoemaker, tanner, carpenter and other craftsmen and professional men, were farmers also; they supplied their own tables.

In colonial days only farmers living less than a hundred miles from Philadelphia were able to market their products there to advantage; poor roads made long hauls impracticable. Farmers along the Delaware, Schuylkill, Susquehanna and their tributaries could float their produce to market. The corn and rye of western Pennsylvania could be converted into whiskey for easier delivery and livestock could be driven to market; but distant farms were at a great disadvantage.

Colonial Domestic Markets

In colonial times markets and marketing were regulated by executive or legislative action. In 1682 it was ordained by the Duke of York, "If any person within this Province or territories thereof shall Expose to sale any corn [all grain] att the common price that is not Clean Drest from Dust, Chaff and such like trash, hee or shee shall pay for every such offense five shillings."[1] This law was abrogated by William and Mary in 1693.

Another regulation authorized officers of the law "to enter into all houses, either with a constable or without, where they shall suspect or be informed of any bread baked for sale, and also to weigh the said bread as oft as they see cause, and seaze all such as they shall find Defective; as also to weigh all Butter made up for sale and brought into or being in the town or market to be sold by Weight," with appropriate penalties.[2]

In order to provide a ready market for farm produce and domestic manufactures the charter of Philadelphia established two market days weekly, Wednesday and Saturday, as was then the custom in Europe.[3] The first market in Philadelphia was a shed on the corner of First and High (Market) streets. In 1693 these regulations were adopted:

"1^{s} That The place ffor y^{e} Markett be in y^{e} High Street where y^{e} Second street Crosses it and in no other place.

2^{dly} That y^{e} Markett be kept There Two days in y^{e} week weekly viz. Wednesday and Saterday.

3. That all sorts of Provision brought to this towne to sale, viz. fflesh, ffish, tame fowl, eggs, butter, cheese, herbs, ffruits, roots &c: shall be sold in y^{e} aforesaid Markett place . . . . .

4^{thly} That y^{e} Markett begin and be open'd at y^{e} ringing of y^{e} bell. . . .

5. That No person Cheapen or buy any of y^{e} afore mentioned provisions by y^{e} way as it Comes to y^{e} Markett. . . .

6. That no hucksters or persons to sell again shall buy or Cheapen any of y^{e} afore Mentioned provision until it hath been two hours in y^{e} Markett after the ringing of The bell. . . .

7. That y^{e} Clark of y^{e} Markett shall and may Receive for all Cattle Kil'd ffor y^{e} Markett Six pence per head, ffor Every sheepe, Calfe or lamb two pence per head, ffor Every hogg or Shoat brought to y^{e} Markett or Cutt out ffor saile there Three pence, and that nothing shall be paid ffor what y^{e} Country people bring to Towne ready Kil'd."[4]

By 1698 Chester, Germantown and New Castle also were market towns. The produce offered for sale at these markets was listed by Gabriel Thomas in that year: "Their Merchandize chiefly consists of Horses, Pipe-Staves, Pork and Beef salted and Barrelled up, Bread and Flower, all sorts of Grain, Pease, Beans, Skins, Furs, Tobacco, Pot-Ashes, Wax etc. which are bartered for Rumm, Sugar, Molasses, Silver, Negroes, Salt, Wine, Linen, Household Goods etc."[5]

The first record of a permanent market house in Philadelphia appears in the minutes of City Council for July 1709. It was built in 1710. A larger market house was built in 1720 on High Street; by action of City Council half of the stalls were reserved for the use of farmers.

In January 1729 Council agreed to erect twenty stalls for the use of New Jersey farmers.

In 1773 the Philadelphia market was again rebuilt and greatly enlarged. Josiah Quincy of Massachusetts then declared, "It is undoubtedly the best regulated market on the continent." This, also, was the appraisal of Johann David Schoepf in 1783: "Astonishment is excited not only by the extraordinary store of provisions, but also by the cleanliness and good order in which the stock is exposed for sale. The Market-house proper consists of two open halls which extend from First to Third streets, and additional space on both sides. Market-street and adjoining streets swarm with buyers and sellers. On the evenings before the chief market days (they are Wednesdays and Saturdays) all the bells in the city are rung. People from a distance, especially the Germans, come into Philadelphia in great covered wagons loaded with all manner of provender, bringing with them rations for themselves and feed for their horses—for they sleep in their wagons." [6]

Markets were established in Lancaster, York and Reading very early in their existence. In 1755 the Proprietary announced: "The Inhabitants of the town of York in the new county of York are become so numerous that they find it necesary to have a public market . . . for the better supplying and accomodating them with good and wholesome provisions under proper regulations." Whereupon the Proprietor, "upon the humble request of the inhabitants of York, grants and ordains that they and their successors shall and may forever thereafter hold and keep within the town, in every week of the year, two market days, the one on Wednesday and the other on Saturday."

The first market fair in Philadelphia was held in 1686. These fairs were patterned after those of medieval Europe. They were held twice a year, in May and November, for three days each and were devoted to the sale or exchange of livestock and household manufactures, "not for the sake of mere profit," said Pastorius, "but that anything which one man or another has over and above his needs may be made purchasable for the others." In 1742 the town of Lancaster was authorized by Assembly to hold two fairs annually, in June and November. The same privilege was extended to Pittsburgh in 1794.

Market fairs flourished for a time but never were as successful as those of Europe. They became centers of drunkenness and disorder. The *Philadelphia Gazette* for October 4, 1759 announced, "Notice is hereby given that the Fair of Bristol Borough in Bucks County will be held on the 9th. day of November next, agreeable to charter, for the buying and selling of all Sorts of live Cattle." The original agricultural objective of this fair was soon lost sight of; in 1773 it was abandoned by order of the Burgess and Council of Bristol because of "the debauchery, idleness and drunkeness consequent on the meeting of the lowest class of people together."

In 1765 the Proprietary granted charter for a fair at York "for the sale of cattle." This, likewise, soon degenerated into a "scene of wild merriment and riotous commotion." It was abolished by the General Assembly, which declared such fairs to be a common nuisance. Other towns had the same experience. Most fairs were abolished before the Revolution; the Philadelphia Fair was discontinued in 1783.

Prior to the Revolution most farm produce was bartered, not sold, since there was little money in circulation. In 1683 it was enacted: "Whereas there is a Necessity for the sake of Commerce in this infancy of things, That the growth and produce of this Province and territories thereof shall pass in lieu of money, *Be it &c.* That all Merchantable Wheat, Rye, Indian Corn, Barley, Oats, Pork, Beef and Tobacco shall be accoumpted Current pay at the Market price in every respective County in this Province and territories thereof. . ." [7]

This law was abrogated by William and Mary in 1693 but a similar law was passed the same year and this prevailed. It provided that corn, wheat, rye, oats, barley, hemp, flax, pork, beef and tobacco should be accepted in lieu of currency at the prevailing market price and were to be considered as money in trade unless the contract stipulated that payment was to be in coin. Fines imposed by courts for minor offenses were commonly directed to be paid in "good and merchantable wheat and rye at the common market price." It was stipulated in agreements that if a debt was to be paid in farm products at the debtor's farm, and these products were not demanded by the creditor when they were in season, the debtor could dispose of them and defer payment of the debt for another year.

In 1786 a merchant in the village of Pittsburgh announced that in exchange for store goods he would accept "cash, flour, whiskey, beef, pork, bacon, wheat, rye, oats, corn, ashes, candlewick, tallow, ginseng, snakeroot, furs, skins, linen etc." The etc. included a great variety of products of farm and forest.

Trade by barter continued in remote parts of Pennsylvania until after 1840. Trade by barter required personal integrity. In the Wyoming Valley, says Henry B. Plumb, "Men and women had to maintain a character for honesty or they were bad off indeed. . . . Everyone had to keep account books and trust and be trusted. An untrustworthy person was very soon known and after that found it difficult to get a living. Such men were very likely to become hunters, being driven to it to procure food. The accounts with neighbors were sometimes balanced every year but they ran in many cases five and ten years."

Certain commodities other than those designated by provincial law had a standard value in barter. When salt was scarce, as it was prior to 1830, a bushel of it was exchanged for twenty or more bushels of wheat. In western Pennsylvania a gallon of whiskey was a standard measure of value. The miller was paid in a proportion of the grist.

The minister and schoolmaster were compensated mainly in produce.

The village store-keeper was the middleman of the farmer and a man of consequence in the community. He carried a very wide assortment of goods which he exchanged for practically everything produced or offered for sale by his rural customers. Some of these offerings were listed in 1790: "boards, shingles, timber, wheat, rye, buckwheat, flax-seed, clover seed, timothy seed, wool, beeswax, feathers, chestnuts, hickory nuts, hides, elderberries, furs, eggs, butter, cheese, tow cloth, linen, etc." This list might be extended very considerably. Even live cattle were taken in exchange for salt, sugar, dry goods and other farm and family necessities. His shelves were stocked with two classes of goods—"European goods," which included imported glassware, hardware, crockery, dress goods, bars of iron, thread, powder, shot, etc.; and "West Indies goods," which comprised salt, molasses, sugar, tea, spices, indigo, rum and similar articles.

When the store-keeper had accumulated a quantity of farm products he sent them to Philadelphia or Balitmore, at first on pack-horses, later on wagons. There they were sold for the coastwise trade or for export and the proceeds were used to restock his shelves.

Until after 1830 the country store-keeper was the banker as well as the middleman of the farmer. He extended liberal credit for goods purchased and helped to finance farmers of his community. Balances on his books were carried over from year to year. Any hard money that farmers received from the sale of produce in the larger towns was carefully concealed in the traditional stocking or loaned out on farm mortgages to less fortunate neighbors.

Marketing through the country store-keeper, while convenient for the farmer, was inefficient. Since the store-keeper took middleman's risks, which were very heavy then, and shouldered the high cost of transportation, he paid low prices. He also charged high prices for his goods. Under conditions prevailing in colonial Pennsylvania perhaps the store-keeper was as efficient a middleman as could be expected. He performed a useful service but he exacted a large profit.

In 1790 a discerning European traveler remarked, "The great want of capital in this country is evidenced by this circumstance: the growers of grain sell at this season regularly, under the knowledge that it will as regularly advance to double the price before the next harvest. . . . Thus store-keepers and other capitalists receive as much for the crop, clear of expense, as the grower himself who clears the land, plows, sows and reaps. We may judge from these considerations how much the farmer is kept back for want of capital."

One of the greatest disadvantages of store-keeper marketing was lack of standardization of products. He received many small lots of farm produce, differing widely in quality, but made little or no attempt at inspection or grading. He paid the same price for butter, pork, etc.

regardless of its quality, hence there was no incentive for the farmer to improve his products.

No census was taken during the colonial period; the following are estimates by contemporaries of the population of the province and of Philadelphia at different periods:

Year	*Philadelphia*	*Year*	*Pennsylvania*
1683	2,000	1681	500
1700	4,400	1700	20,000
1750	13,400	1720	50,000
1760	18,000	1740	100.000
1770	28,000	1760	200,000
1780	30,000	1776	300,000
1790 (first census)	42,444	1790	434,373

In 1790 the six eastern counties—Philadelphia, Chester, Bucks, Lancaster, Berks, York—had a population of 211,000. There were only 63,628 people in the trans-Allegheny counties of Westmoreland, Fayette, Washington and Allegheny.

The dearth of local markets prior to 1790 is indicated by the census figures of that year. The largest towns other than Philadelphia were Lancaster, 3,773; Reading, 2,205; and York, 2,076. Pittsburgh was a frontier village of 376. Bethlehem, Lebanon and Harrisburg had less than a thousand inhabitants each. Chambersburg, Carlisle, Wilkes-Barre, Bristol, Allentown, Easton, Gettysburg, Huntingdon, Shippensburg, Bedford, Uniontown and Brownsville were rural villages. Mani-

"New Market" in Philadelphia as it appeared in 1788.

festly the surplus products of Pennsylvania farms had to find a market in Philadelphia, Baltimore or the export trade, not in local communities.

Philadelphia was the metropolis of the province and its only city. It was natural that Philadelphia merchants should expect that city to be the market center of the entire province. Geographical considerations, however, made this impracticable. The natural outlet for farm products of central Pennsylvania then was down the Susquehanna to Baltimore rather than overland, in part, to Philadelphia. Prior to the Revolution frontier counties were much more closely in touch with Baltimore than with their own capital city.

The Maryland legislature made every effort to encourage this trade, especially by building good roads. Philadelphia merchants, who dominated the Pennsylvania legislature, apparently felt secure in possession of the trade of frontier counties and made little or no effort to lower the cost of transportation from the Susquehanna to their city. They ignored the pleas of farmers of Lancaster and adjoining counties for better roads. In 1769 over 40,000 tons of Pennsylvania flour were exported from Baltimore. "From Harrisburg and Carlisle," says Scharf, "to the upper part of the Valley of Virginia, Baltimore was the only place where the people traded."

Ultimately the trading area of Baltimore was extended to the New York state line and even beyond. In "An Address to the Merchants and Inhabitants of Pennsylvania," in 1771, it was stated, "Baltimore town in Maryland has within a few years past carried off from this city almost the whole trade of Frederick, York, Bedford and Cumberland Counties."

About 1764 Philadelphia merchants awakened to the unpleasant truth that the western trade had slipped away from them. Alarmed at this threat to the commercial supremacy of their city, and to their own profits, they sought means of regaining the business. It was proposed to build good roads into the interior, to connect the Susquehanna and Schuylkill by a canal and "to improve the navigation of all rivers, so far as they lead toward our capital city." The impending struggle with Great Britain, however, soon overshadowed local trade rivalries and nothing was accomplished until 1794, when the Lancaster Turnpike was opened. This inaugurated a state-wide program of internal improvements under which Philadelphia regained much of the trade it had lost to Baltimore, but not all.

COLONIAL EXPORTS

Almost from the beginning of the colony Pennsylvania farms produced a surplus for sale. The limited domestic market made exports the main outlet. It was fortunate that the colony could produce to advantage a staple that was in constant demand abroad. The great export commodity of Maryland and Virginia was tobacco; of the Carolinas, cotton and rice; of Pennsylvania, wheat. For more than a century Pennsylvania was the "bread basket of America" and the most prosperous of the colonies. The economy of the province was founded on wheat.

In his celebrated essay on "Plantations" Bacon advocated that the colonies be granted not only freedom from the payment of customs but also freedom to sell their products in any market which offered the highest price. The British Government did not follow this enlightened counsel. In April 1661 it decreed, "No sugar, tobacco, cotton, wool etc., . . . of the growth, produce or manufacture of any English plantations in America . . . shall be shipped . . . from any of the said plantations to any land . . . other than to such other English plantations as do belong to His Majesty." Wheat, pork, beef and other farm commodities were added to the list later.

In 1663 it was further enacted, "No commodity of the growth, production or manufacture of Europe shall be imported into the British plantations but such as are laden and put on board in England . . . in English-built shipping, whereof the master and three fourths of the crew are English." The purpose of these two edicts was to compel the colonists both to buy and sell in English markets exclusively. In 1757 Parliament specifically prohibited "the exportation of corn, grain, meal, malt, flour, beef, pork, and bacon from all the American colonies, except to Great Britain and Ireland."

Like the other colonies, Pennsylvania flaunted these selfish and unjust regulations. Pennsylvania was at a disadvantage in export trade as compared with Virginia. The staple of that colony, tobacco, was in steady demand in Britain; whereas the staple of Pennsylvania, wheat, was in demand only when the European crop was short or when war raged. For many years Britain excluded American wheat.

Being thus debarred from trade with the mother country, Pennsylvania sought other markets, in defiance of British laws. Its merchants built ships and developed illicit trade with other countries, particularly the Dutch, French and Portuguese West Indies. Sugar planters of the West Indies were engaged in a highly specialized type of agriculture which utilized the labor of negro slaves, and were obliged to import most of their food. During the eighteenth century they prospered greatly and provided an excellent market. To these Carribbean islands were shipped wheat, bread, smoked and salted beef and pork, horses and other farm products. The first commodity exported to the West Indies from Pennsylvania was horses, in 1683.[8]

The first export outlet for grain was to other colonies. In 1690 it was stated, "We supply New England with abundance of wheat and have carried Bread, Flower, Beef, Pork and strong Beer to Maryland

and Virginia, which hath vended well."[9] In 1691 another colonist wrote, "The Country-men finding the profit now coming in . . . do now spare great quantities of corn [all grain, chiefly wheat] to our Neighbor Provinces which formerly we were forced to be beholding to the Merchants making great Merchandizes, viz: for the West Indies. I understand Ten or Twelve Sail went loaden thither last Summer with Biskit, Flower, Beef and Pork."[10]

Other colonies, however, did not provide sufficient market outlet for Pennsylvania grain. In 1700 Pastorius recorded, "We sell our superabundance of grain and cattle in Barbadoes for brandy, syrup, sugar, and salt, but we send the fine pelfries to England."[11]

A few years later the list of commodities exported was considerably extended. In 1702 Daniel Falckner reported, "The chief commerce of Pennsylvania is with the Bermudas, Barbadoes, Jamaica, and Antigua, to which are shipped flour, ship-biscuit, strong beer, butter, cheese, smoked and salted meats, salt fish etc. In return there comes to us wine, rum, sugar, indigo, Jamaica pepper, ginger, lemons, melons, and similar fruits and spices; likewise cotton, hides, negroes and slaves and the like. Besides we trade with other colonies . . . sending the same merchandize and receiving from them money or such products as they have."[12] A considerable quantity of produce was necessary to provision fishing fleets that centered at Philadelphia; in 1700 these vessels numbered about 5,000.

Most of the export trade was for cash. Gold and silver were needed to pay the large balance of trade with England, from whence came most Pennsylvania imports. Until after the Revolution imports from Britain greatly exceeded exports, mainly because of restrictions imposed by that country, as is indicated by the following statistics:

Year	*Exports to Britain*	*Imports from Britain*
1698	£2,720	£10,704
1718	5,588	22,716
1738	11,918	61,450
1758	21,383	260,953
1774	61,611	625,652

The discrepancy had to be met somehow; the most feasible method was to sell produce to the West Indies and elsewhere for cash and use the money to balance accounts with Britain.

The thrifty Quaker merchants of Philadelphia—traders and salesmen by instinct—early recognized the desirability of fostering the export trade by standardizing products. In 1699 the General Assembly adopted the following regulations:

"To prevent the exporting of unsound and unmerchantable beef and pork, *Be it further Enacted* That no person after the publica^{n} hereof, Shall presume to ship any beef or pork before it be first viewed, pack't or repack't by an allotted officer or packer, Which shall (after the said officers view & approbac^{n}) be markt with the said officer's mark. . . . And to the end, That all Bisket and flower made for transportation shall be well made & honestly & truly pack't, for the encouragement of trade . . . *Be it Enacted by the Authority* aforesaid That all persons that make flower and Bisket for transportation shall sett their marks on their Casks before shipt." This law also designated the content of containers for various commodities in gallons, the containers "to be made of good, sound, well-seasoned white oak timber"; and directed, "All Coopers shall sett their respective marks on all such Casks." [13] In 1727 further regulations were enacted "to prevent unfair practices in the packing of beef and pork"; this law prescribed the size of containers (31 ½ gallons) and required that they be branded. Under these and other regulations the export market for farm produce developed rapidly.

A considerable market for Pennsylvania wheat developed in Europe other than in Britain, much to the annoyance of that country. In 1711 Isaac Norris wrote, "The country has within ten or twelve years increased to near ten times its produce of corn, wheat especially. The market of Lisbon has been of great advantage to us. We have now going seven or eight vessels and some of them large." [14] For many years Portugal was one of the best markets for Pennsylvania foodstuffs. Between 1734 and 1740, 158 ships cleared from Philadelphia for Portugal and thirty-six more for the Portuguese islands of Madeira and Azores. Spain, also, was an open market. The wheat, pork and beef of Pennsylvania, however, could not compete in these markets except when the European supply was short; the West Indies was a much more stable market. Trade with these islands continued until interrupted by the Revolution; it was never fully regained thereafter.

According to Benjamin Franklin, in 1751 there were exported from Pennsylvania 129,960 barrels of flour, 86,000 bushels of wheat, 90,743 bushels of corn, 240 tons of bread, 3,431 barrels of beef, 4,812 barrels of pork and 70,000 bushels of flaxseed. [15] Europeans did not know corn and there was little demand for it there. Flaxseed went mostly to Ireland; the peak of flaxseed exports was reached in 1771, when 110,000 bushels were shipped. Throughout the colonial period pork was exported in greater quantity than beef.

Wheat and its products dominated the export trade for more than a century. Flour mills were built very soon after English occupation of the province stimulated, perhaps, by Caleb Pusey, "The Governor's Miller." By 1700 Pennsylvania farmers had made bread and flour "a drug on all the markets in the West Indies." [16] On March 5, 1709, James Logan wrote to William Penn, "The country people of this Province have of late generally fallen upon the practice of bolting their own wheat and selling or shipping the flour." [17]

Failure to inspect and standardize export flour and bread, as was done for beef and pork, soon demoralized the market. By 1720 prices had fallen so low that the Governor sent a message to the legislature: "For the sake of the whole country, who must live by the products and manufacture of grain, it is absolutely necessary that the making of good bread and flour be regulated so as to recover their lost credit in the market of the West Indies."[18] Thereupon the Assembly adopted rigid inspection laws which soon regained the trade.

In 1721 a disastrous flood destroyed many flour mills on streams in southeastern Pennsylvania but they were quickly rebuilt. Early in the eighteenth century Philadelphia became the most important mart of the flour trade in America; it was the center of the largest wheat-producing area and had excellent water communications. Newspaper advertisements of farms or farm land for sale always stressed the availabilty of flour mills on or near the property and possible sites for mills. Flour mills were the most important manufacturing industry of the colony. By 1765 Philadelphia had out-distanced New York in this respect. In that year it exported 367,522 bushels of wheat and 18,714 tons of flour and bread; New York, 109,666 bushels of wheat and 5,519 tons of flour and bread. The mills on the Brandywine were particularly famous for the high quality of their flour.

Flour dominated Pennsylvania exports until after the Revolution. For the year April 5, 1765 to April 5, 1766 the major exports were:[19]

198,516	bbls. flour @ 15 shillings per hundred weight	£251,246
367,522	bu. wheat @ 5/3 per bu.	96,474
12,094	hhds. flaxseed @ 70 shillings per hhd.	42.329
34,736	bbls. bread @ 15 s. per bbl.	32,565
6,645	bbls. pork @ 70 s. per bbl.	23,257
60,205	bu. Indian corn @ 3 s. per bu.	9,030

Of total exports that year amounting to £567,521, about eighty-five percent was wheat, flour and bread. In 1775 Pennsylvania exports amounted to £705,500 sterling, of which £350,000 were for flour and £100,000 for wheat. Speaking of the West Indies trade before the Revolution Herbert C. Bell says, "Pennsylvania and New York, with some assistance from Maryland and Virginia, offered virtually the whole amount of flour and bread . . . Pennsylvania again led in supplying beef, pork, hams and tongues."[20]

At the beginning of the Revolution Pennsylvania had far outdistanced other colonies in exports. Philadelphia merchants, whose dingy counting-houses and warehouses lined the waterfront, had representatives in many foreign countries and sent their ships across the "Seven Seas." At one time Robert Morris, the "Financier of the Revolution," owned more ships than any other man in America. Many Philadelphia merchants whose luxurious country seats were the pride of the metropolis accumulated their fortunes in the agricultural export trade.

MARKETS DURING THE REVOLUTION

The Revolution resulted, in part, from severe restrictions in trade and manufacture imposed upon the colonies by Great Britain. Another contributary cause was "hard times," both in Britain and in America. The industrial revolution, from home manufacture to factory production, had begun in England. The agricultural revolution, from self-sufficing farming to commercial agriculture, was in progress there also. These radical changes in way of life caused widespread depression in England; this was reflected in the colonies.

Practically complete cessation of exports resulting from the blockade of American ports during the war was a severe blow to Pennsylvania agriculture. On September 10, 1774, the Continental Congress passed the non-importation and non-exportation resolution, under which the colonies were pledged, "under the sacred ties of virtue, honor and love of country," not to import any goods from Great Britain or ship any goods there and to seek to develop home markets. The need of producing more wool was stressed, woolens being one of the chief imports from Britain. Sheep husbandry prospered for a brief period during the war while efforts were being made to stimulate domestic production of woolens, mainly by home manufacture.

The large volume of wheat and wheat products formerly exported was turned back upon domestic markets. Some slipped by the blockade. Micheaux reported that farmers of Bedford County "found it more to their advantage to send their corn [all grain, mostly wheat], flour &c. to Pittsburgh, there to be sent by the Ohio and the Mississippi to New Orleans, or embark them for the Carribees, than to send them to Philadelphia or Baltimore. [21] The same was true during the Napoleonic wars.

The number of men who left farms to serve in the Continental Army was not large in proportion to the total rural population, hence production was not seriously curtailed during war years. Depredations on farms by British and American armies were slight. The British paid liberally, in gold, for supplies and there was considerable trade with the enemy. Says Harold U. Faulkner, "The farmers seemed only too willing to double their prices for the French and to sell their produce to Howe, while Washington's men shivered and starved at Valley Forge."

This indictment is unjust to the majority of Pennsylvania farmers, who were patriots. It did apply to farmers who were Tories, or pacifists, of which there were a considerable number. Pennsylvania could not have been "the granary of the Revolution" if a majority of her farmers had been mercenary.

The province, as a whole, was nearly equally divided in allegiance. Most of the tories and conscientious objectors were in the six southeastern counties; the remainder of the province was strongly patriot. It is doubtful if independence could have been achieved without the support of rural Pennsylvania in both men and provisions. Quakers and German sectarians, though prevented by religious conviction from fighting, contributed effectively to the cause by supplying great stores of wheat, cattle, horses and other provisions—and at a reasonable price.

DOMESTIC MARKETS AFTER THE REVOLUTION

The half century following the Revolution witnessed a remarkable transformation in the national life. The pent-up energies of the young republic, no longer rendered impotent by restrictions imposed by Britain, burst forth in a torrent of exploration, exploitation and invention. Agriculture was the main beneficiary of this development.

During this period the industrial revolution was in progress in Pennsylvania. Manufactures were being transferred from homes and the shops of local craftsmen to factories. This gave rise to a non-agricultural class who were consumers but not producers of food. Industrial cities and towns arose; ultimately these home markets became the main outlet for farm products. Better and cheaper transportation facilities—turnpikes, canals, railroads—made these markets accessible, even to remote farms. The export market became relatively less important. Labor-saving machinery began to replace hand tools. Subsistence farming, heretofore dominant, gradually gave way to commercial farming. The impact of these epochal developments was felt first in the southeastern counties, last in the sparsely settled districts of central and western Pennsylvania.

At the close of the Revolution Pennsylvania was almost wholly rural. By 1840 it was still overwhelmingly rural but urban centers were developing rapidly. The number of mouths to feed in the state more than trebled in half a century, from 434,373 in 1790 to 1,724,033 in 1840. All parts of the state shared in this growth but it was greatest in the six southeastern counties—Philadelphia, Chester, Bucks, Lancaster, York and Berks. These grew from 211,000 in 1790 to 995,000 in 1840.

In 1790 Philadelphia, city and suburbs, had a population of 55,000; in 1840 it had 205,850. The growth of other centers was not as marked but was sufficient to provide home markets for thousands of tons of produce that formerly had been exported. Some of the more important of these were:

	1790	*1840*
Pittsburgh	376	21,115
Reading	2,225	8,417
Lancaster	3,773	8,314
York	2,076	5,745
Harrisburg	860	6,240

Small market towns began to dot the state, mainly county seats. Among these were Bristol, Allentown, Easton, Bethlehem, Wilkes-

Barre, Lebanon, Shippensburg, Carlisle, Chambersburg, Gettysburg, Huntingdon, Uniontown, Sunbury, Washington, Brownsville, Meadville, Erie. Prior to 1840 the growth of cities and towns, as yet without railroad connection, resulted in the development of some specialized farming near them. Market gardening, fruit growing and dairying had begun to assume some commercial importance near Philadelphia by 1830.

Wheat dominated Pennsylvania farming until after 1840, when livestock gradually supplanted it. In 1840 Pennsylvania produced one-sixth of the wheat crop of the nation. Most of the grain was exported but a steadily increasing proportion was consumed in domestic markets.

In the era of the Conestoga wagon, Center Square, Delaware County, was an important wheat mart. Wentz Tavern of that town was known far and wide as the "Wheat Market." Abraham Wentz tells the story: "As a boy I was impressed by the long procession of heavily-laden Conestogas from the upper counties . . . The farmers travelled together because the roads were bad and they could be mutually helpful. The procession grew as farmer after farmer along the route joined it; by the time they reached the 'Wheat Market' there were nearly a hundred in line . . . At night the teamsters brought blankets and narrow mattresses from their wagons and, spreading them out on the bar room floor, slept there.

"Next morning early the millers from Philadelphia and the surrounding country came to the 'Wheat Market.' Then there was a lively time bargaining, disputing and settling prices. . . . After a day spent in this way the buyers returned home and the farmers spent a second night at the 'Wheat Market,' leaving early the next morning to deliver the wheat to the millers." [22]

Before railroads were built great quantities of wheat from farms along the Susquehanna and its tributaries were floated down the river in arks and other craft destined for Baltimore or Philadelphia. If for the latter market, it was transferred to Conestoga wagons at Middletown or Columbia. In 1795 La Rochefoucauld reported, "Middle Town becomes the storehouse of all grain which is produced in the country above it along the Susquehanna and not consumed there. From 160,000 to 180,000 bushels of wheat are yearly bought up by the corn [all grain] dealers here, on the spot where it grows, conveyed to Middle Town and deposited in granaries there. The millers of the surrounding country usually buy it here and grind it into flour and send it to Philadelphia." [23]

After the Lancaster Pike was constructed, Columbia wrested supremacy in river trade from Middletown. In 1809 Joshua Gilpin recorded, "Columbia is seated on the lowest point where the Susquehanna is safely navigable . . . It is the grand depot of all the produce of this vast river . . . About 100,000 Barrels of flour, 300,000 bushels of wheat, an immense quantity of lumber, a great deal of coal, iron, whiskey, beef and pork. . . . The flour is chiefly sent to Philadelphia . . . the wheat is bought for the Lancaster and Chester county mills . . . Some of the arks and vast numbers of rafts go down the river for the Baltimore market." [24]

The magnitude of the Susquehanna River trade before canals and railroads were built is indicated by the volume of products, exclusive of livestock, which descended the river in 1824:[25]

County	*Wheat* bu.	*Clover seed* bu.	*Whiskey* bbls.	*Pork* tons
Union	150,000	6,000	2,800	200
Northumberland	190,000	3,500	2,000	180
Centre	180,000	5,000	—	—.
Lycoming	100,000	—	900	—
Clearfield	3,000	—	—	—
Columbia	100,000	3,000	3,000	250
Luzerne	90,000	—	500	1,000
Tioga	10,000	—	—	—

According to the report of a committee of the Senate, between February 28 and June 23, 1827 there passed Harrisburg 1,370 arks and 1,631 rafts. "It is supposed that the rafts contained on an average 25,000 feet of lumber, which would amount to 40,755,000 feet. Two hundred of the arks were laden with anthracite coal, averaging thirty-five tons, making 11,000 tons. The remaining 1,170 arks were laden principally with flour and whiskey for the Baltimore market and carried an average of 400 barrels each, making 468,000 barrels. It is supposed that about 300 keel-bottomed boats carrying from 800 to 900 bushels of wheat each descended during that period, say 800, making 240,000 bushels of wheat." [26]

The preeminence of Luzerne County in pork production continued for many years. In 1828 that county marketed outside its borders "190,000 bushels of wheat, 1,000 barrels of pork, 500 barrels of whiskey, 100,000 bushels of corn, besides large quantities of other grains." [27]

Not all the farm products of south-central Pennsylvania were marketed by water. In 1794 Theophile Cazenove passed through Franklin County and observed, "They send flour to Baltimore, 64 miles. The carting from here to there costs 1 dollar a barrel. The load is 12 barrels of 180 lbs, drawn by five horses, or four strong ones." [28] After 1820 turnpike roads offered an alternative method of transportation. A large proportion of the surplus products of Centre County farms, chiefly wheat, clover seed, whiskey and flaxseed, was hauled to Philadelphia in Conestoga wagons, from ten to fifteen days being required to make the round trip. After 1800 long trains of Conestoga wagons brought produce of the trans-Allegheny region to eastern markets. Traffic over the turnpike at Chambersburg, now the Lincoln Highway, for March 1830, was:[29]

Flour	3,450 bbls.	Hemp	25,500 lbs.
Whiskey	364 bbls.	Wool	8,000 lbs.
Clover seed	365 bu.	Beeswax	11,400 lbs.
Butter	25,007 lbs.	Lard	6,200 lbs.
Eggs	3,415 doz.	Bacon	134,600 lbs.

The Ohio and Mississippi rivers were the natural means of transporting farm products of southwestern Pennsylvania to market. These were chiefly wheat, flour, corn, salt pork, beef and whiskey. Before the Revolution this trade was mostly with the West Indies. By 1800 Pittsburgh was a bustling center of trade with the South and West. Situated at the head of navigation on the Ohio, it was the "Gateway to the West." Here thousands of adventurous spirits, seeking new homes in the Mississippi Valley and the "Great American Desert," outfitted for the journey. It was the most important distribution center of the nation.

When the first census was taken, in 1790, the entire population of southwestern Pennsylvania was less than 75,000, practically all of whom were farmers. Ten years later Pittsburgh had a population of 1,565. By 1820 it had grown to 7,248 and by 1840 to 21,115. It was then an industrial city of distinction, using bituminous coal as power in manufacture. It had numerous rolling mills, foundries, glass plants and manufactories of nails and agricultural implements. The iron industry was small then, because iron ore of good quality had not yet been discovered near Pittsburgh.

From Pittsburgh the products of western Pennsylvania farms moved to market down the Ohio and Mississippi to the growing towns of Cincinnati, Louisville, St. Louis and New Orleans; also to the West Indies, Atlantic seaboard cities and Europe. They were floated down in arks, barges, flatboats and keel boats and later in steamers.

After the Revolution river trade with the Spanish at New Orleans increased rapidly in spite of many drawbacks, chief of which were restrictions imposed by officials of that "foreign country." The hazards of river traffic were enough to daunt the spirits of all but the most courageous and most sanguine—delays or complete loss caused by floods, spoilage due to heat and humidity, and market gluts when everybody rushed down the river during favorable water conditions. Added to these trials was the capriciousness of Spanish officials, who imposed custom charges, restrictions or embargoes without warning.

The Mississippi was closed to American commerce by Spain in 1784 but these restrictions were relaxed for a few favored shippers. "If the Mississippi trade was opened," said H. H. Brackenridge of Pittsburgh in 1787, "last year's grain would not lie in the barns and discourage the husbandman from fresh labours." [80] After long-drawn out negotiations with Spain the treaty of 1795 ensured free navigation of the river and opened the market and port of New Orleans to all comers. Not until then was there any stability in the river trade. The purchase of Louisiana in 1803 made possible a marked expansion of the river market for western Pennsylvania products.

Until the Pennsylvania Canal and the Portage Railroad were built, Pittsburgh and western Pennsylvania were shut off from Philadelphia by "the impassable Alleghenies." This isolation, as well as fundamental differences in temperament between Quakers and Germans of the East and Scotch-Irish of the West, was responsible for coolness, not to say antagonism, between the two sections. Although New Orleans was 2,000 miles away it was a more accessible market than Philadelphia, 350 miles away. It cost as much or more to transport a bushel of wheat from western Pennsylvania to Philadelphia as the wheat was worth. Not until after 1850, when an all-rail route across the Alleghenies was opened, did southwestern Pennsylvania, which once had aspired to be the "State of Allegheny," really become a part of Pennsylvania in spirit.

Some prosperous farmers of western Pennsylvania built river craft, loaded them with produce and made the long trip to New Orleans. Most of the business, however, both river and overland trade, was in the hands of middlemen. In 1806 Thomas Ashe described the prevailing marketing process: "The entire business is conducted without the use of money. The produce consists chiefly of flour, corn, salt, cyder, apples, live hogs, bacon . . . In little towns and settlements along the rivers the stores exchange goods for the above production, charging on their articles at least 300 per cent and allowing the farmer very low terms for theirs. . . . The store keepers make two annual collections of these commodities; send them down the river to New Orleans and there receive an immense profit in Spanish dollars or bills on Philadelphia . . . They then purchase more goods of all kinds and send them by waggons over the mountains to their stores. . . . The words *buy* and *sell* are unknown here; in business nothing is heard but the word *trade*." [31]

In 1817 Fearon wrote, "There is a class of men through the western country called merchants who in the summer and autumn months collect flour, butter, cheese, pork, beef, whiskey and every species of farming produce, which they send in flats and keel boats to the New Orleans market. The demand created by this trade, added to a large domestic consumption, insures the most remote farmer a certain market. Some of these speculators have made large profits." [32]

Some farm produce of northwestern Pennsylvania went north to market, instead of south. In 1816 David Thomas passed through Waterford, Erie County, then head of navigation on French Creek. He observed, "Several thousand barrels of flour have passed up; and on the turnpike we met waggon after waggon loaded with flour which was destined chiefly for Detroit and Mackinaw."[33]

WHISKEY AS A FARM PRODUCT

For nearly a century a considerable proportion of the corn and rye produced in Pennsylvania was marketed as whiskey. This fiery liquor was the almost universal beverage of men, women and children. There was little or no moral or religious sentiment against it then.

"There was a time in the early history of southwestern Pennsylvania," says George D. Albert, "when whiskey was the one commodity that had a standard value and all the mediums of barter and exchange, such as corn, salt, tobacco, etc., were valued in accordance with the amount of whiskey they would fetch. When coin was almost unknown and paper money valueless, as it was for some years after the close of the Revolution, a whiskey still was as necessary as a grist mill . . . Nearly every fifth or sixth farm had a copper still. The farmer who had one manufactured the whiskey for his neighbors who had none, on shares . . . It bought farms as now it frequently loses them; and the consideration which passed for many a tract of land was chiefly whiskey and whiskey stills." [34]

"Old Rye" was bartered at the country store for farm and home supplies. "Some farmers," says W. J. McKnight, "kept no cows, but always kept whiskey in their homes, alleging that a barrel of whiskey was of more value to a family than a cow."

Before the coming of turnpikes, around 1800, whiskey was about the only farm product that it would pay to transport over the Alleghenies to Philadelphia and Baltimore. A pack-horse could carry twenty-four bushels of rye as whiskey but only four as grain. A copper still, or access to one, was considered essential to every farmer. In 1790 there were over 500 stills on the farms of Washington County, or approximately one to every ten farms.

The farm stills of Greene County are described by William Hanna: "Two or three little farmers whose land lay adjoining, finding themselves in possession of a surplus of rye, would agree to start a distillery at the largest and best spring either of them possessed. When this was erected they were ready to manufacture not only their own surplus but that of their neighbors. . . . The whiskey was generally reduced to 'fourth proof,' then placed in kegs holding from six to ten and even twenty gallons each. The kegs were then put in a wallet and placed across the back of a pack-horse . . . When some twenty or thirty pack-horses were thus fitted out the caravan was ready to start East." [35] According to Thomas Cooper, "One bushel of rye will produce about eleven quarts of salable whiskey, which fetches per gallon 4s. 6d. by the barrel." [36] In 1820 the United States census enumerators reported that it was futile to try to classify distilling as an industry separate from farming in southwestern Pennsylvania because it was almost universal throughout the rural districts.[37]

Southwestern Pennsylvania, however, was by no means the only part of the state in which whiskey was a major farm product. Thousands of barrels of whiskey were produced annually in central and northern counties and floated down the Susquehanna to Baltimore and Philadelphia. In the Lackawanna Valley, according to H. Hollister, "the coarser grain, being turned into the still house, made whiskey so cheap that no husking, raising or logging bee, nor any public business or social meeting took place without this abundant product of the still . . . The commercial agency of whiskey was recognized in all the laws of trade with the same uniformity and force that the Indians used wampum. Property changed hands and many a settler acquired a peaceful title to wild domain by the exchange of a few gallons of whiskey." [38]

The New Berlin *Union Times* for March 26, 1825 reported: "Union County sends annually to market a surplus of about 150,000 bushels of wheat, 2,800 barrels of whiskey, 6,000 bushels of clover seed, 200 tons of pork. . . . Northumberland County spares a surplus of about 190,000 bushels of wheat, 2,000 barrels of whiskey, 180 tons of pork, 3,500 bushels of clover seed. Centre County spares for foreign consumption about 180,000 bushels of wheat, 6,000 bushels of clover seed and 1,000 barrels of whiskey."

In 1832 the chief exports of York County were:[39] 125,000 barrels of flour, $625,000; 500,000 bushels of grain, $375,000; 2,704,000 gallons of whiskey, $611,200. Says John Gibson, "From 1810 to 1840 nearly one-fifth of the farmers of York County owned a copper still, by which they distilled their own cereals into whiskey and hauled it into Baltimore." [40] According to George R. Prowell there were 178 distilleries in Cumberland township, York County in 1810. "Only the coarse grains—corn, rye, barley—were converted into liquor. Upon only one or two occasions did an audacious distiller make whiskey out of the more precious wheat, to the great horror and outcry of all right-minded people."[41]

In 1829 a journal reported, under the heading "Profitable Farming," that the major items of income that year of a Columbia, Lancaster County farmer were:[42] "Proceeds of whiskey sold in Baltimore, $2,533; 67 hogs $569; Wheat, 500 bushels at $1.55, $775; a total of $3,877."

This proportion between solid and liquid sustenance was typical of many other southeastern counties.

In 1756 the General Assembly imposed an excise tax on all distilled spirits. This created such an uproar that it soon was repealed. Under the Constitution adopted in 1787, the states delegated to the Federal Government power to impose excise taxes and duties on exports and imports. Seeking means of reducing the Federal debt, in 1791 Congress imposed an excise tax of four pence a gallon on all distilled spirits.

There was bitter opposition to the tax, especially among Scotch-Irish of southwestern Pennsylvania. They had come to the New World, among other reasons, to escape just such taxes. They felt that this tax was discriminatory against them since about the only way to market their grain profitably was to convert it into whiskey. They pointed out that this tax represented about one-fourth the net value of the whiskey they produced but only one-eighth the value of whiskey produced on farms along the Brandywine. All stills had to be registered; this necessitated a system of surveillance and espionage that was obnoxious to these liberty-loving people.

In 1794 the Federal Government began to enforce the law. This led to open rebellion in the southwestern counties. President Washington sent a military force of about 15,000, many of them Pennsylvania militia, to bring the rebellious citizens of the young republic under control. Opposition to the excise tax, however, was not limited to southwestern Pennsylvania. "Liberty poles" were erected at Chambersburg, Carlisle and other eastern towns. Excisemen or collectors were roughly handled in Chester County. After the rebellion was suppressed, Congress repealed the tax.

Farm production of whiskey began to diminish about 1840. The advent of railroads and the development of local markets made it more profitable to market corn, rye and barley as grain or as livestock. The temperance movement which swept the state between 1825 and 1845 also had a profound influence. The American Temperance Society was organized in 1826, with state, county and village auxiliaries. The temperance movement was closely allied with the great religious revival of that period.

After 1850 farm production of whiskey in Pennsylvania practically ceased. Following the trend of the times in all industries, distilling was transferred from domestic manufacture on farms to large commercial enterprises in cities.

There was little improvement in the marketing process prior to 1840; the farmer was largely at the mercy of merchants and speculators. After 1830 current market prices of livestock, grain and a few other farm commodities were published in farm journals and a few newspapers, but they were neither timely nor reliable. Most farmers had to depend on rumors, which often were inaccurate or belated.

Lack of information on market conditions and inefficient marketing methods often resulted in unnecessarily low prices. The situation at Reading in 1795 was noted by Rochefoucauld: "In winter, when the navigation [of the Schuylkill] is obstructed by ice, the neighboring farmers who happen to be in want of money bring their corn [all grain] to town. The wealthy inhabitants buy it at a low price, lay it up in granaries and send it to Philadelphia as soon as the river is navigable." [43]

Country store keepers were the chief middlemen of farmers until after 1840. By 1830 there were a few specialized middlemen for commodities that were bought and sold in large quantities, such as wheat and cattle. Drovers who took cattle from western Pennsylvania to Baltimore or

Philadelphia often combined the function of a middleman with that of transportation. After 1830 agents of woolen mills travelled about the country and purchased the farmers' wool clips.

Much marketing still was direct. Farmers near Philadelphia and all the larger towns and villages sold their livestock to local butchers. Every large town had a market place to which farmers brought their produce once or twice a week. According to Peter Neilson, in 1830 the Philadelphia market still retained the pre-eminence it had held for more than a century: "The markets of Philadelphia have been much celebrated and deservedly so. . . . They are situated in Market Street, which is a hundred feet wide, and are built in the form of sheds. . . . These sheds extend from the Delaware River very nearly a mile in length and are daily furnished with every necessity or luxury which the country affords. . . . On certain days, also, the country people bring in an immense quantity of provisions in waggons, which are arranged along the upper part of this street and one of the cross streets. Sometimes the waggons occupy a space of two miles in length." [44] He could have observed the same scene, on a smaller scale, in all the larger towns of the state.

One of the first farmer cooperatives in the United States was that of the barley growers of Chester and adjacent counties. Becoming convinced that Philadelphia brewers had agreed together to keep the price of barley at a low level, in 1822 they erected a brewery in Philadelphia to brew their own grain. The venture was not successful and was soon abandoned.[45]

The rise of hay and corn as the major farm crops of Pennsylvania, supplanting wheat, and the beginning of the emergence of the dairy industry as the keystone in the arch of prosperity of Pennsylvania farmers, are indicated in census statistics of the state for 1839:[46]

Wheat	13,200,000 bu.	Hay	1,300,000 tons
Rye	6,600,000 bu.	Flax and Hemp	2,650 tons
Corn	14,200,000 bu.	Wool	3,000,000 lbs.
Oats	20,600,000 bu.	Products of the dairy	$3,187,000
Barley	200,000 bu.	Products of orchards and gardens	$900,000
Potatoes	9,500,000 bu.		

POST-REVOLUTION EXPORTS

Immediately upon the close of the Revolution exportation of farm products was resumed. Philadelphia was the first port in the Union; in 1791 more than one-third of all the exports of the young republic passed through that city. In 1793 more than 1,400 vessels engaged in foreign commerce entered her harbor and over 4,000 vessels engaged in coastwise trade. Great Britain and the West Indies continued to be the best foreign markets. The trade of several northeastern counties continued to go to New York City and that of western Pennsylvania largely to Pittsburgh and down the Mississippi. On June 25, 1785, Britain prohibited the entry of American wheat because of the outbreak of Hessian fly here. This was absurd for the insect could not be transported in grain.

Exports of foodstuffs from Pennsylvania reached a peak about 1807. From 1790 until 1807 there was heavy European demand to supply deficiencies caused by war and crop failures. From 1808 to 1814 foreign trade was greatly curtailed, first by the embargo and non-intercourse acts, then by the War of 1812. Thereafter, and until 1842, conditions in Europe and in the West Indies were not favorable for exports. After 1808 the foreign market, heretofore a very important outlet for the farm produce of Pennsylvania, especially wheat, was over-shadowed by the domestic market. In 1842 Great Britain removed its prohibition upon the importation of American cattle and provisions and in 1849 abolished duties on grain. These acts, together with the Irish famine of 1846, gave American foodstuffs a new foothold in the European market.

Wheat flour, the product of numerous Pennsylvania mills, continued to be the chief export commodity. Before the Revolution there was exported from Philadelphia over 268,000 barrels a year. After the war foreign trade revived rapidly; as noted by Tench Coxe, flour exports were 202,000 barrels in 1787, 359,000 barrels in 1789, and 420,000 barrels in 1792. "The export of flour from Pennsylvania," he says, "with the wheat, was equivalent to 1,200,000 bushels in 1788 and about 2,000,000 in 1789." [47]

The same authority reports the major exports of Pennsylvania from October 1, 1791 to September 30, 1792:[48]

Pot-Ash	50,190 tons	Corn	414,262 bu.
Pearl Ash	17,170 tons	Flour	347,742 bbls.
Wheat	130,723 bu.	Corn Meal	34,335 bu.
Rye	10,083 bu.	Hams and Bacons	305,230 lbs.

Pennsylvania continued to protect her export trade by prescribing inspection of products and standardization of containers. A law passed in 1789 required that all beef and pork intended for export be packed in white oak barrels containing 300 pounds of meat, "secured with salt and pickle." All shipments were to be inspected at the port, for which there was a charge of sixpence a barrel. Inspection of flour, butter, corn meal and other products was required and their standard of quality defined, as well as the dimensions of containers in which they were shipped.[49] "An Act for the Inspection of Butter Intended for Export" passed January 7, 1804, provided, "Every keg containing Butter for exportation. . . shall contain fifty pounds of Butter, sufficiently salted." [50] In 1818 an English traveller wrote, "Philadelphia is noted for its flour. As many as 400,000 barrels of 196 pounds each have been exported in a single year and of the best quality, every barrel being examined by sworn inspectors." [51]

THE FARMER'S MONEY

Gold and silver currency was very scarce in colonial days; most sales were by barter. The little money secured by farmers was likely to be hoarded; it was too valuable to circulate. Money received by Philadelphia merchants from the sale of produce to the West Indies and elsewhere was drained out of the colony as fast as it was received, to pay for manufactured goods imported from Britain.

Prior to the Revolution there were no mints in the colony and no banks. Having no money of its own, the colony had to use such foreign coins as were received for exports. When money was particularly scarce, farmers sometimes cut gold or silver coins into quarters or eighths, and used this "cut money" for small change.

The principal hard money was the Spanish silver dollar or "piece of eight," derived mainly from the West Indies trade. For many years this was the accepted unit of circulation. Few English crowns, shillings and sixpences were in evidence, nevertheless it was necessary to express values in terms of English currency. This caused great confusion, especially since each colony placed different valuations on the same English coin. During the jurisdiction of Connecticut in the Wyoming Valley six shillings of "Connecticut Currency" were equivalent to one Spanish dollar; after the valley came under Pennsylvania rule seven shillings and sixpence were required. In some colonies the Spanish dollar was valued at four shillings eight pence.

Accounts were kept in English pounds, shillings and pence for some years after the Revolution, even though little of this currency was in circulation. There were many perplexities in the computation of money from English to American values. Many years were required before farmers ceased to think in terms of pounds, shillings and pence.

Farmers were distrustful of paper money, which was much depreciated and counterfeited. The Continental Congress issued paper money to the amount of $241,500,000 between 1775 and 1780. In 1782 it required $300 of continental money to equal one silver dollar. In 1779 it required $1575 to buy a barrel of flour; by 1785 continental money was practically worthless and people twisted it into tapers to light candles.

No money was minted until 1782 when Robert Morris of Philadelphia, "The Financier of the Revolution," was asked by Congress to recommend an American system of coinage. This was established on April 2, 1792 and is the present system. It was based on the Spanish dollar, with which the colonists had long been familiar, as the unit of value with decimal (tenths) subdivisions. Thereafter Spanish, English and other foreign coins gradually disappeared.

There were no banks in colonial days. If a farmer desired to transmit money to a distant creditor he must take it to him in person or send it by messenger. When paper money was in good standing, farmers sometimes mailed a creditor half of a hundred dollar bill, reserving the other half until receipt of the first half was acknowledged, whereupon the other half was mailed.

The first bank in Pennsylvania and in the nation was the Bank of North America, which was chartered by Congress on May 26, 1781, and opened for business in January, 1783. On April 1, 1782, the General Assembly gave it a state charter also. The first state bank, the Bank of Pennsylvania, was chartered March 30, 1793, with headquarters at Philadelphia and branches at Pittsburgh, Lancaster, Reading, Easton and Harrisburg. It was a strong institution for many years but failed during the panic of 1857. After 1800 many other banks were chartered by the state; by 1836 there were forty-nine, of which seventeen were in Philadelphia. They flooded the state with poorly secured paper money. This caused a speculative fever which culminated in numerous bank failures during the panic of 1819 and the depression of 1837-1841. A considerable number of private banks developed during the inflationary period of the War of 1812; these issued small notes that were intended to pass for currency, but conservative farmers declined to accept these "shinplasters".

After 1830 every country banker and nearly every country storekeeper—the farmers' chief middleman and banker—subscribed to the weekly "Bank-Note Detector". This reported all banks that had failed recently, current discount on the paper money of each bank, and gave information on methods of detecting counterfeit notes and coins. One never could be sure that a bank note accepted today would not be worthless tomorrow. These chaotic conditions brought about the first effective act of the General Assembly for the supervision of banking, on March 21, 1841.

The experience of Lancaster County farmers with banks is typical of monetary conditions of that period. Of forty banks chartered by the State in 1814, five were in Lancaster County. Cheap money ensued and prices jumped; good farm land sold for $200 an acre. Many of these banks closed their doors during the panic of 1819. "Such as had purchased or accepted farms at the high rates, without the means to pay for them, became bankrupt. The price of land dropped to $50 an acre. The sheriff gathered a rich harvest and the jail was full of debtors. Only those who had refused to be drawn into the vortex of speculation weathered the storm."[52] "This adventure with cheap money and high land prices," says Walter M. Kollmorgen, "left its impress on the farmers of the county. They learned that if they wanted to have money it must be made in constructive farming, not in skimming off unearned increment."

Observing the orgy of speculation, bank failures, depreciated currency and counterfeit bank notes, it is no wonder that farmers were suspicious of all banks and all paper money. They looked with distrust on all credit institutions except the local store-keeper and insisted on receiving hard money for produce not bartered. This was stored in old stockings at the bottom of chests or hidden behind a loose brick in the wall of the house. It did not earn interest; neither was it lost in bank failures. When enough money was accumulated it was used to buy more land or was loaned on farm mortgages. Many German farmers did not charge interest on such loans to friends and neighbors of similar religious faith but made them in mutual trust, with no record but a notation on the kitchen door or in the Farmer's Almanac. Not until long after 1840 were banks used by any considerable number of farmers as a credit agency and safety deposit.

DEVELOPMENT OF HOME MARKETS THROUGH MANUFACTURES

The development of home markets through manufactures was opposed by the British government. Before 1700 all colonial governors were instructed "to discourage all manufactures and to give accurate accounts of any indication of the same." It was frankly stated that the purpose of establishing colonies was "to be of benefit to their mother country, to which they owe their being and protection." They were expected to derive all their nourishment from the maternal bosom. Said Lord Chatham, "The British colonists of North America have no right to manufacture even a nail or a horseshoe." The intent was to keep the colonists a race of farmers, producing raw materials for British industries and depending on British factories for clothing, implements and other manufactured goods. This economic policy would have been ruinous to the colonies; they were expected to exchange raw materials for finished products and to pay the freight both ways. The balance of trade was heavily against them.

During the early years of the nation many political leaders were of the opinion that factories should not be encouraged. They believed that our economy should remain purely agricultural, that factories would be a demoralizing influence in American life. Thomas Jefferson was the most prominent exponent of this point of view. He said: "While we have land to labour on, let us never wish to see our citizens occupied at a work-bench. Carpenters, masons and smiths are wanted in husbandry; but for the general operations, let our workshops remain in Europe . . . The loss by the transportation of commodities across the Atlantic will be made up in happiness and permanence of government." [53]

The far-seeing Franklin was one of the first to discern that the colony could not exist without manufactures and that these would benefit agriculture by providing home markets. In 1771 he wrote, "In England it is well known and understood that whenever a Manufactures is established which employs a Number of Hands, it raises the Value of Lands in the neighboring Country all around it, partly by the greater Demand near at hand for the Produce of the Land, and partly from the Plenty of Money drawn by the Manufactures to that Part of the Country. It seems, therefore, the Interest of all our Farmers and Owners of Lands to encourage our young Manufactures in preference to foreign ones imported among us from distant Countries." [54]

Tench Coxe of Philadelphia was another earnest advocate of manufactures. In 1794 he wrote: "Opinions have prevailed in America that manufacturing employments are injurious to the best interests of the country; that the pursuit of agriculture should occupy all our citizens. . . . Without manufactures the progress of agriculture would be arrested on the frontier of Pennsylvania . . . In a country thus circumstanced, producing the great raw materials for manufactures and possessing unlimited power by water and resources of fuel . . . to neglect manufactures would be highly criminal." [55]

In 1800 George Logan addressed "A Letter to the Citizens of Pennsylvania": "The farmers . . . should give every encouragement to Manufactures, by which they may procure a certain and steady market at their own doors for the surplus of their industry." [56] In 1801 John Beale Bordley of Philadelphia added the weight of his powerful influence to the argument for the establishment of industries as a means of promoting home markets for farm produce: "Why should not this nation, in its present youthful vigor, begin to apportion her employment between husbandry and manufactures, which in experience prove so promotive of wealth and independence as to have rendered Britain rich in all comforts. . . . Besides, in the course of a great influx of emigrants to America many if not the greater number are mechanics." [57]

The advocates of manufactures carried the day. Several industries developed near Philadelphia before the Revolution, especially flour milling, textiles, iron, paper and the manufacture of boots and shoes. By 1790 Philadelphia had thirty factories employing more than 500 workers. Several of the larger inland towns, as Germantown, Lancaster, York and Bethlehem, had one or more factories in addition to the much larger number of people engaged in domestic manufacture. By 1800 nearly half the population of Philadelphia, then a city of 42,000, was engaged in the manufacture of flour, paper, textiles, leather goods, metal goods and other products. Fully one-third of the people of Lancaster, then a town of 6,000, was employed in the manufacture of cloth and clothing, leather and metal goods, wood products and iron. The industrial revolution was not fully accomplished until after 1840, when railroads began to bring raw materials and coal to manufacturing plants in centers of population, but it began half a century earlier.

Under the leadership of Henry Clay the Congress of 1816 enacted a protective tariff to provide revenue and to safeguard industries that had developed during the War of 1812, especially in New England and Pennsylvania. Matthew Cary of Philadelphia was an ardent advocate of this "American System." One of its chief objectives, he said, was to provide home markets for farmers. In a message to the General Assembly on December 7, 1820, Governor Findley called attention to the current low prices of and limited demand for the agricultural products of Pennsylvania in foreign markets and urged the up-building of manufactures as a means of aiding agriculture.

In 1832 a committee of the General Assembly, reporting on this subject, made this estimate:

"For each ton of bar iron and casting made, the following agricultural produce is found to be consumed:

20 bu. wheat and rye @ 75 cts.	$15.00
57 lbs. pork @ 5 cts.	2.85
43 lbs. beef @ 4 cts.	1.72
10 lbs. butter @ 12½ cts.	1.25
2 bu. potatoes @ 30 cts.	.60
½ ton hay @ $7	3.50
Horse employment	1.43
Fruits and vegetables	1.00
	$27.35

"Which, multiplied by the quantity of bar iron and castings produced in Pennsylvania, will give the sum of $3,415,850 paid by iron manufacturers and those employed by them to farmers." [58] Possibly this particular statement is biased in favor of manufactures, but it sets forth the inter-dependence of agriculture and industry.

In 1824 Richard Peters of Philadelphia made this prophecy: "The farmers in the vicinity of our cities and particularly of Philadelphia will find ere long that they must change their present modes and substitute some other products in place of those now commonly cultivated which can be brought from great distances and furnished at a cheaper rate than can be afforded by those who inhabit the neighborhood of the city. . . . The city will become a great manufacturing as well as a commercial Emporium. The exuberant plenty of raw materials, particularly coal and iron, will raise up factories, which will increase population. . . . Thus the cultivators of the soil in those regions will find markets at their doors sufficient to require the great proportion of their products." [59] This prophecy was amply fulfilled within a quarter century. By 1850 Pennsylvania was beginning to be dotted with small cities and industrial towns which absorbed most of the farm produce formerly exported.

At the close of this period, in 1840, agriculture was still the dominant industry of the state. The two leading agricultural counties were Chester and Lancaster, Chester being the center of the beef industry and Lancaster the premier county in crop production, mainly wheat, oats and corn. The infant dairy industry was mainly in Montgomery, Delaware, Bucks and Chester counties; Philadelphia was not yet large enough and means of transportation not efficient enough for dairying to prosper far removed from the city.

The paramount importance of agriculture in 1840 is revealed in census statistics of that year for southeastern counties, showing the number of persons employed in various occupations:

County	*Agriculture*	*Commerce*	*Manufacturing and Trade*
Chester	11,571	365	4,550
Lancaster	10,285	250	3,928
Montgomery	8,382	197	3,764
Bucks	8,247	428	2,737
York	5,525	175	3,349
Delaware	3,303	52	2,088

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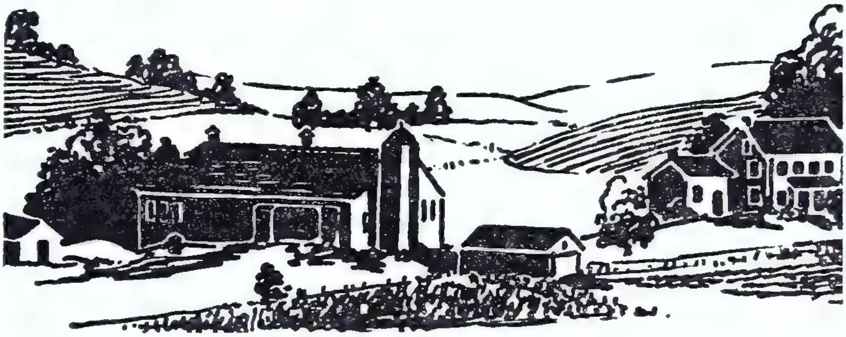


PROFIT AND LOSS

FARMING is a way of life as well as a commercial enterprise; most Pennsylvania farms pay dividends that are not entered on the credit side of the ledger. Nevertheless, a reasonable return upon the investment of time and money is the primary measure of successful farming and is a prerequisite to the development of a satisfying country life.

The curve of agricultural prosperity in Pennsylvania shows many variations. When farming was mainly of the subsistence type there was far less fluctuation of income than in the present period of highly specialized commercial agriculture. The income from a well-managed farm, which includes a large proportion of direct products for the living of the family, is more stable than in most other business enterprises.

Capital Investment

Capital investment has increased from practically nothing in pioneer days to an amount comparable to that required in many businesses. In 1817 Morris Birbeck, an English traveller, observed, "There is, properly speaking, no capital employed in agriculture here. . . . The whole stock of the first settlers generally consisted of their two hands. The property they now possess, the fruit of the labour of these hands, can hardly be considered as capital." In the two centuries from 1640 to 1840 the farmer was transformed from a laborer having little invested in his farm but the work of his hands into a business man, the proprietor of an enterprise requiring a considerable investment of money as well as labor.

In early colonial days the initial investment in land was small. A large proportion of pioneers, especially those outside the three original counties, paid nothing at all. The price set by the proprietaries ranged from twenty-five to seventy-five cents an acre, with a small annual quit-rent. Most of it was sold at the lower figure and few quit-rents were collected. In 1694 the widow of John Chapman traded 100 acres of good land at Wrightstown, Bucks County, to William Smith for an old grey mare. Many desirable tracts on the western frontier changed hands for nothing more tangible than a few gallons of whiskey.

Virgin land was cheap, labor dear. The cost of land was almost wholly the labor of clearing it; this was supplied by the purchaser. Few pioneer farms of 200 to 500 acres represented an initial investment of more than $500 for land, buildings and equipment.

The small capital investment in pioneer farms is indicated by the valuation set on the farm of Thomas Langhorne of Neshaminy Creek, Bucks County. In 1686 he reported, "J. Harrison & a neighbor have just estimated the value of the plantation & the stock & corne reaped etc. at £180, for 860 acres. . . . The stock is a mere & 11 Swyne, There is near 10 acres of cleared land within fence, yet but meanly cleared & as slenderly husbanded." [1] Presumably one or more log houses and several log sheds were included in this inventory.

After 1700 land values near Philadelphia increased rapidly because of demand from incoming settlers. Between 1700 and 1725 "improved" land in the three original counties sold by the acre at the current value of twenty bushels of wheat. Thus in 1724 in Bucks County, "wheat 2s.6d., land 2 £ 10s.; wheat 3s., land 3 £ ; wheat 5s., land 5 £." [2]

As immigrants continued to pour into the province, unseated land in the older counties became scarce and prices correspondingly high. This situation, together with declining yields due to soil exhaustion, was the most compelling reason for the movement of immigrants into the Susquehanna River basin and eventually west of the Alleghenies. In 1750 Gottlieb Mittelberger found that the best land in southeastern Pennsylvania, exclusive of the "German tract" in Lancaster County, was valued at about £4 per acre; and the "back lands" at 3 s. to 4 s. per acre and even less.[3] A desirable farm within fifty miles of Philadelphia having a comfortable house, adequate barn and sheds and fertile soil cost about $50 an acre in 1750.

The nearer to Philadelphia, the smaller the holdings became. In 1700 the average size of farms in Philadelphia, Bucks and Chester Counties was about 600 acres; by 1765 it was 135 acres. In the "back counties" of Lancaster, York and Berks farms were 300 to 500 acres in 1765. Only a small part of large farms, however, was cultivated; most of the land was in forest. Under conditions prevailing at that time it was essential that every farm have a large acreage of woodland to supply firewood, fencing and building material.

Until after 1800, the equipment of most farms represented a meager investment. In 1786 Colonel George Morgan, a recognized authority on agriculture, made the following statement:[4] "To stock a good grass farm of 200 acres would require:

Waggons, Harness, Horses and Oxen,	£200
Carts, Ploughs, Barrows, & Rollers	50
6 Cows, 6 Yearlings, and 6 2-Year-olds	70
12 Swine	15
100 Sheep	50
Bags, Dairy Furniture, Wheat Mill, Wheel Barrow, Shovels, Spades &c.	30
	£415"

Most farms of that period were greatly under-stocked. The list of taxables for 1780 in what is now Cocalico Township, Lancaster County, indicates the valuation for assessment purposes of some of the best farms in that rich agricultural district, and the small number of livestock:[5]

"John Bucher, 160 acres, 2 horses, 3 cows	£360
Isaac Adams, 130 acres, 2 horses, 3 cows, 2 mills	420
Peter Beinhower, 100 acres, 2 horses, 4 cows	232
Abraham Brubaker, 200 acres, 2 horses, 4 cows	632
John Ream, 300 acres, 2 horses, 3 cows	926"

Obviously these farms were operated on a subsistence basis.

The small capital investment required in farming before the Revolution is further indicated by an estimate made in 1775 by a competent authority: "Land, 20-30 cents an acre; building a home, $200; building a barn and stable, $100; horse, $20; cow, $15; swine, $1.00; sheep, $1.00."[6]

For several decades after the Revolution farming was at low ebb in the older districts, largely because of depleted soils and economic dislocations resulting from war. Near Philadelphia eight bushels of wheat were considered an average yield and land values declined accordingly. The rich limestone lands of Lancaster and adjacent counties, however, continued to produce heavily and to advance in value. In 1791 George Washington wrote to Sir John Sinclair, "I understand that from thirty to forty dollars per acre . . . may be denominated the medium price [of farm land] in the vicinity of the Susquehanna in the state of Pennsylvania."[7]

Some farms with substantial brick or stone buildings sold for much more. In 1794 Theophile Cazenove, American agent of the Holland Land Company, wrote, "In this district [Lancaster County] farms are from 200 to 300 acres, good land and beautiful country, limestone land. You have to pay for farms with improvements from £15 to £20 an acre."[8] This was especially true of farms which had a considerable acreage of irrigated meadow. "In Franklin County," he says, "farms are generally from 200 to 300 acres; 140 plough land, 20 meadow, 140 woods, house and barn. They bring from £6 to £10 per acre. . . ."[9]

Land values were higher in Pennsylvania than elsewhere, especially limestone soil because of its suitability for the production of wheat. Benjamin Rush explains this: "We are able to tell the value of a farm in any part of the state by first finding out the quantity of grain [wheat] an acre will produce and the price of the grain at the nearest mill or store, making some allowance for the improvements which are connected with the farm. This remark is so universally true that a farmer never mistakes the application of it in purchasing land." [10]

On the western frontier farms were larger and their value per acre lower. In 1791 Samuel Mills contracted to sell to Anthony Bierly 300 acres in Centre County for thirty-two shillings (about $8.00) an acre.[11] In 1806 Thomas Ashe reported conditions in the Pittsburgh area: "Good land on the banks of a river and near a market town is not to be had under ten dollars an acre; but land under ordinary circumstances brings only two to five dollars. Such land yields from twenty to thirty bushels of wheat and from forty to sixty bushels of corn." By 1835 improved land in that area was valued at $7 to $20 an acre.

In Susquehanna County, on the northeastern frontier, it was reported in 1819: "As a general estimate, a farm of one hundred acres, one half of it cleared, with a common log house and barn on it, would be estimated at from £225 to £270, or from one thousand to twelve hundred dollars. . . . Two Hundred acres of land, one half cleared, with a farm house and buildings on it, would cost $2,000." [12]

Some business-minded farmers had enterprises in addition to the farm and had a correspondingly larger investment. Such a one was a Mr. MacAlister, near Harrisburg, whose operations were described by Rochefoucauld in 1795: "He is a farmer and at the same time proprietor of a corn mill, a saw mill, a distillery and an inn. . . . His cultivated land amounts to one hundred and twenty acres. . . . He grinds fifteen thousand bushels of wheat a year on his own account. . . . He sends his meal in waggons to Philadelphia. . . . His saw mill is almost constantly going, the logs being floated down the river from the upper country . . . His whiskey he sells on the spot; the grain for the distillery he receives from the upper country. He distills yearly about four thousand gallons." [13]

After the Revolution, the country seats of the well-to-do were striking contrasts with the small acreage and meager investment of most working farmers. The 1,600 acre farm of John Beale Bordley of Philadelphia, located on Wye Island, Chesapeake Bay, while more representative of southern plantation life than of northern farming, indicates the large capital investment of many wealthy patrons of agriculture:

"His little domain was an active scene of business and industry; the numerous buildings rising far and near around the old fashioned mansion, (whose front extended 100 feet) had the appearance of a village.

. . . There were carpenters' and blacksmiths' shops, always busy. Looms and spinning wheels in appropriate buildings; these prepared all the coarse materials for laborers' clothing and were supplied with fleeces from Mr. Bordley's own flocks and his own hemp, flax and cotton. On another side a rope walk, a brick yard and kiln . . . a windmill of uncommonly large dimensions . . .

"On another side a large brew house built of his own bricks. . . . A double milk house also of his home made bricks . . . A complete two-story warehouse for storing wheat and other grain ready for shipping; a shepherd's house . . . A spacious ice house, store house, hen house, pigeon house, stables." [14]

The "Great Awakening" in Pennsylvania agriculture between 1790 and 1840, featuring the more general use of gypsum, lime, red clover, grass and livestock, resulted in a more prosperous agriculture and higher farm values. According to Henry D. Fearon, in 1818 the best farms in the Cumberland Valley brought $200 an acre.[15] In 1830, when the fame of Chester County for the production of beef was at its height, superior grazing land in that county brought $200 to $300 an acre. The average price of good farm land in most parts of the state, however, was $50 to $75 an acre. Farms became smaller, not only because of subdivision among children but also because of more intensive cultivation and higher valuation; in 1838 the average size of farms in Berks County was 75 acres.

Comparatively few farms were operated by tenants prior to 1800 for the reason given by Tench Coxe in 1794: "The medium annual land rents in Europe are greater per acre than the medium purchase price here." Land could be acquired so easily and cheaply—by squatting if not by purchase—that few men were willing to be renters.

In 1801 an English farmer, William Strickland, forcefully set forth the devastating effect of renting on soil fertility: "So great is the difficulty of procuring regular tenants that people here who possess more land than they choose to occupy or can cultivate themselves are getting much in the way of letting it upon shares, a system which nothing but extreme poverty or extreme ignorance can vindicate. . . . The terms of this tenure are various; in some instances the owner finds half the seed and half the livestock, the tenant everything else, and he has half the produce; in other instances the owner finds half the livestock and has one third of the produce. . . . Wherever this mode of occupancy is found, poverty and the worst of cultivation attend it, as ever must be the case where the interests of the owner and the occupier are at eternal variance." [16]

A contract to sell a tract of land in Centre County, in 1791, is typical of such transactions at that time. It stipulates that the buyer shall pay all taxes and assessments; plant within four years an orchard of at least

100 apple trees; clear and put into English grass at least seven acres for a meadow; fence all improved parts of the farm; and pay thirty-two shillings an acre, one-fourth at the time of signing the contract and the balance within four years, deed to pass when the last payment is made.[17]

WAGES

Investment in hired labor during this two hundred year period was small. Probably at least ninety per cent of the work on farms was done by the farmers themselves with the aid of their families and with the occasional assistance of neighbors in certain operations, particularly in clearing land, erecting cabins and barns and harvesting. On the larger farms, indentured labor—redemptioners, debtors, felons and apprentices—was used sparingly and there were a few negro slaves. Land was easily and cheaply acquired, hence free labor was scarce and dear. For the most part, the return from farming represented the labor earnings of the farmer and his family.

Pennsylvania never has attempted to regulate the rates of wages, except temporarily and locally in time of war. William Penn suggested that this be done but the Assembly, after prolonged discussion, wisely decided against it.

The cost of labor in colonial days seems very low as compared with the present cost unless interpreted in terms of purchasing power; then it is seen to be relatively high. Wages of the few freemen who were hired by the early Swedes were equivalent to about $60 a year, present money, and keep; wages of day workers were about forty-eight cents a day in summer and thirty cents in winter, with meals. In 1695 the prevailing wage in Bucks County was fourteen to fifteen pounds a year and keep; day workers were paid eighteen to twenty-five pence a day in summer.[18]

In 1698 Gabriel Thomas recorded: "Labouring men have commonly here between 14 and 15 Pounds a Year and their Meat, Drink, Washing and Lodging; and by the day their Wages is generally between Eighteen Pence and half a Crown and Diet also; But in Harvest they have usually between Three and Four Shillings each Day and Diet." [19]

By the middle of the eighteenth century free labor was paid sixteen to twenty pounds a year and "found." In 1754 Lewis Evans of Philadelphia stated, "Men who are paid for ploughing about Town here, and find their own Cattle and Fodder, have about 12 or 15/ an acre for breaking up land, and a little above half as much for stirring or sowing it. A good Farmer's Servant is hired by the Year in our Province at about 15 or 18 Pounds. Day Wages for Mowing or Reaping, besides Victuals & Rum, 2/3. And a common Hand will reap and bind an Acre a Day. Thrashing Wheat is 4 d. a Bushel." [20]

With free labor so difficult to secure and so expensive, most farmers preferred indentured labor. A contract in 1788 between Samuel Wallis, a farmer in that part of the "New Purchase" now known as Northumberland County, and John Betz and Dorothea, his wife, provided that Wallis would pay thirty pounds ten shillings for their passage from Rotterdam to Philadelphia. In return, Betz and his wife agreed to serve Wallis for a term of four years, "honestly and obediently in all things as good and faithful servants ought to do". Wallis agreed that during their term of service he would "find and provide for the said servants sufficient meat, drink, apparel, washing and lodging." [21]

There was little change in the wage of farm hands for two or three decades after the Revolution. In 1791 Richard Peters wrote George Washington, "Our wages for hirelings, by the day, are commonly 2 s. in winter and 2s.6d. nine months of the year, for common day's work on the farm, and everything found, as eating and drinking. The same man will hire and find himself at 3s. and 3s.6d. per day. . . . As to mowing, or what is called cradling grain, we pay a man 5s. to 6s. per day and found, and the day's work is . . . two or two acres and a half a day . . . The yearly hire of a good labourer in Pennsylvania is, I think, sixty dollars, or 22£10s. currency and found, clothing excepted." [22]

Henry B. Plumb, historian of the Wyoming Valley, quotes an entry in the account book of a farmer near Wilkes-Barre for about 1790, with wages reduced approximately to present currency:[23]

"One day's work holding plow,	.40
One day's work mowing,	.66
One day's work cradling,	1.00
One day's work making rails,	.50
One day's work breaking flax,	.33
One day's work chopping,	.33
One day yoke of oxen and plow,	.33
One day horse plowing corn,	.26"

After 1800 the development of city and town markets and the advent of the "New Agriculture" resulted in more prosperous farming and higher wages. In 1819 Robert H. Rose of Susquehanna County wrote: "A labourer gets from three quarters of a dollar to a dollar per day. . . . A dollar will purchase twenty pounds of beef or sixteen pounds of mutton or veal, or one bushel of rye or Indian corn, or two thirds of a bushel of wheat. Thus three or four day's work of a common laborer will supply him with provisions for a month." [24]

Wages fluctuated with the rise and fall in the price of farm products and with the locality, especially nearness to Philadelphia. In 1828 Chester County farmers paid $80 to $100 a year and keep; or forty cents a day with board; or sixty-two and a half cents a day and "find themselves." [25] Farther from Philadelphia, especially on the frontier, wages were lower. In 1832 the customary wages in Bedford County were "from five to seven dollars a month, when board and lodging are provided; if by the day, from thirty-one to thirty-seven and a half cents. The cradler has from seventy-five to eighty cents a day, the reaper and mower from thirty-seven and a half to fifty cents."[26] In the Wyoming Valley "skilled workmen received 3s.9d. [50 cents] per day and board; unskilled labourers 2s. 6d. [33½ cents]. All had to take their pay in the produce of the farm. This was the way wages were paid until after 1830."[27]

The purchasing power of these seemingly low wages was high. Mooney Thomas, an English observer of the American scene, wrote: "You can obtain good board, lodging and washing for a little less than ten British shillings, or two and a half dollars, a week. You will be able to save seven or eight shillings a week to buy a farm, which farm you can buy for five shillings an acre . . . You can save the price of an acre and a half of the finest land in the world every week."[28]

Prior to 1840 both custom and law fixed a "day's work" as from sunrise to sunset; this makes it difficult to compare the cost of labor then with present prices. The first break in this general practice was in 1840, when President Van Buren signed an executive order fixing a day's work in the Washington Navy Yard at ten hours. The ten hour day was not generally observed by hired labor on farms, however, until long after 1840.

In the absence of efficient machinery, the cost of many farm operations was often higher than it is today. Harvesting wheat with a cradle cost about $1.50 an acre. The usual price for flailing wheat was twelve and a half cents a bushel and five cents for oats, the workmen providing their own food. A fair day's work threshing for one man was eight bushels of wheat or twenty of oats. About 1820 a bushel of wheat was the customary payment for a day's work cradling that grain and a bushel of corn for a day's work husking.

Scarcity of labor has characterized Pennsylvania agriculture from the beginning. By 1840 the shortage was acute; factories had begun to compete with farms for manpower while at the same time requiring more food. Farm wages were rising faster than prices of farm products; from one third to one half more produce was required to pay farm labor in 1840 than in 1800. If Pennsylvania farmers were to meet the competition of the West, it was imperative that available labor be made more effective. This was accomplished by the development of labor-saving machinery.

TAXES

Levies for the support of government increased in proportion to the amount of service expected from government. In early colonial days this service was slight and taxes were correspondingly low or nonexistent.

For many years taxes were paid in produce, there being little money in the colony. In 1676 the Duke of York's laws specified that taxes were to be paid in "Corne, beefe or porke att the price herein mentioned (that is to say) Wheate, not exceeding 5s. the bushel; Rye and pease, 4s.; Indian Corne, 3s.; oats, 2s. 6d.; beefe att 3d. and porke at 4d. per pound; and no other payment shall be allowed of." [29]

The first land tax in Pennsylvania was levied by the Court of Chester County on August 6, 1685. The levy was 2s.6d. per hundred acres, to be paid in wheat at 4s.6d. per bushel, rye at 3s.6d. per bushel or corn at 2s.8d. per bushel.[30] This and other early levies were for the support of county government; no land taxes were levied for the support of the provincial government, which met its expenses by excise taxes and tavern licenses. On the frontier even county taxes were seldom collected from farmers who were mostly tax free until after 1740.

Taxes remained low or practically non-existent for several years after the Revolution. In 1791 a York County farmer reported to George Washington, "No land-taxes have been assessed by the State since the establishment of the general government. . . . Pennsylvania has a surplus revenue after paying all the debts, which is intended to be applied to the improvement of roads and navigation. No land tax is expected to be levied by the State. A rate of sixpence in the pound upon personal property will, in general, be more than sufficient to pay the county tax. The road and poor tax will not come so high. We pay an excise tax on wines and spirits of all kinds; he that drinks must pay." [31]

The first continuing tax on horses and cattle was imposed in 1799. A summary of the tax rate on representative farms in several counties was given to George Washington in 1791 by John Hare Powel, President of the Pennsylvania Agricultural Society:[32]

County	*Av. Acres in each farm*	*Poor tax*	*County tax*	*Road tax*
Franklin	360	none	none	35s.
York	500	"	40s.	30s.
Northumberland . . .	300	"	10s.	30s.
Fayette	364	15s.	10s.	none
Cumberland	650	2s. 6d.	60s.	27s.
Chester	500	35s.	70s.	35s.
Delaware	450	30s.	60s.	60s.
Washington	300	none	20s.	12s.
Philadelphia	80	16s. 10d.	22s. 5d.	15s. 2d.

Usually the road tax was paid in labor, which rarely exceeded two days a year.

After 1810 taxes advanced rapidly, largely because of the demand for better means of transportation. In 1822 Nicholas Biddle of Philadelphia said, "The average rent of land within twenty miles of Philadelphia cannot, I think, be estimated beyond three dollars . . . Taxes of all kinds, judging from those of Bucks County, do not exceed twenty-five cents an acre; making the rent and taxes of a farm of two hundred acres six hundred and fifty dollars." [33] This increased at least fifty per cent during the next twenty years.

PRICES

Prices of farm products during this two century period swung up and down under the influence of many variables, such as the season, competition from other producing areas, economic conditions at home and abroad, peace or war. They also varied considerably with the locality, much more so than at present.

Until about 1790 prices were expressed in terms of British currency. It is difficult to compute the value of these units in present money since the rates of exchange varied from year to year. In 1719 a pound sterling was worth $2.66⅔ present currency; a shilling 13½ cents; a pence 1⅑ cents. At times, the exchange was nearly double these rates.

In 1685 William Penn reported prevailing prices in his province: "Beef, two pence per pound; pork, two pence half penny; veal and mutton, three pence; wheat, four shillings a bushel; rye, three shillings; corn, two shillings six pence; a good cow and calf for three pounds and a pair of working oxen for eight pounds." [34]

In 1698 Rowland Ellis of Bryn Mawr quoted "good Horse, £4; good Cow, £5 or 6; beefe ye last fall, 2½ d. per pound; pork, 3d.; cheese, 7d.; butter, 10d. to 1 s. per pound; mutton, 5 d.; Wheat, 8 s.; Rye, 6 s."[35] The first market quotations in the public press were printed in the *American Weekly Mercury* of Philadelphia for December 29, 1719: "Flour, 9sh. 6d. to 10 sh. per hundr.; Pork, 45 sh. p. Barrel; Beef, 30 sh. p. Barrel; Wheat, 3 sh. 3d. to 3 sh. 5 d. p. Bushel; Indian Corn, 1 sh. to 1 sh. 8 d. p. Bushel."

During the Revolution and for a few years after, prices advanced. In 1791 a York County farmer reported to George Washington that average prices of farm products at the town market of York for the years 1783 to 1789 were: [36]

	s.	*d.*		*s.*	*d.*
Wheat	6	0	Speltz	2	6
Rye	3	6	Potatoes	2	0
Barley	4	0	Turnips	1	0
Oats	2	0	Hay (ton)	£3	
Buckwheat	2	6	Hackled flax (lb.)	1	s.
Corn	3	0	Hemp (lb.)	5	d.

Another correspondent reported that average prices for livestock in that county in 1791 were:[37]

	£	s.	d.		£	s.	d.
Working horses	20	0	0	Turkey	0	2	6
Pair of working oxen	17	0	0	Duck	0	2	6
Milk cow	4	10	0	Goose	0	1	9
Sheep	0	12	6	Dung-hill fowl	0	0	6
Hog	1	10	0				

Average prices of livestock products at that time were: pork 3½ cents a pound; beef, 3 cents; mutton, 4 cents; veal, 3 cents; butter, 8 cents; new cheese, 6 cents.

From the account book of a Wyoming Valley farmer for the years 1791 to 1800 Henry B. Plumb quotes current prices as expressed approximately in present currency values:[38]

Apple trees, .07 each
Beef, fresh, lb., .04
Butter, lb., .13
Buckwheat, bu., .50
Corn, bu., .40 to .50
Cows, $12 to $15 (in 1840)
Chickens, .13 each
Cider, bbl., $2.00
Cheese, lb., .06 to .11
Eggs, doz., .06 to .12 (in 1840)
Flax, lb., .13
Flour, rye, lb., .03
Flour, wheat, lb., .05 to .06
Hay, ton, $5.33 to $8.00
Potatoes, bu., .33
Pork, salt, lb., .07 to .13
Pork, fresh, lb., .04
Plaster (gypsum), ton, $13 to $17
Rye, bu., .50
Sheep, $1.50 to $2.50 (in 1840)
Veal, lb., .06
Wool, lb., .27 to .50
Wheat, bu., .80 to $1.00

In 1810 prices in Pittsburgh were:[39]

Beef, .04 lb.
Flour, $2.12 cwt.
Corn, .33 bu.
Potatoes, .40 bu.
Butter, .15 lb.
Turkeys, $1.00 per pair
Pullets, .20 per pair
Pork, .04 lb.
Mutton, .04 lb.
Veal, .03 lb.
Eggs, .10 doz.
Bacon, .08 lb.
Whiskey, .40 gal.
Cyder, $3.00 bbl.
Dried apples, $1.00 bu.

These prices should be correlated with the cost of living in Pittsburgh at that time as reported by Ashe: "The best taverns charge half a dollar a day for three meals and lodging; and there are boarding houses on the terms of only a hundred dollars a year for board, lodging and washing."

The dubious expedient of subsidies and price-fixing for farm products has been tried in Pennsylvania several times and found wanting. In 1715 the Provincial Assembly passed "An Act for the more effective encouraging of the raising of hemp"; this provided a subsidy of one penny a pound on merchantable hemp. Even this generous bounty failed to stimulate hemp production. It languished and ultimately was abandoned, save in Lancaster County; cultural and economic conditions elsewhere in the state were not favorable. The bounty was removed in 1732. Subsidies for encouraging the production of silk and several other products were equally ineffective.

In 1725 Francis Raule of Philadelphia published a paper speciously called "Ways and Means for the Inhabitants of the Delaware to Become Rich."[40] By "Delaware" was meant all territory on both sides of that river. "No reasonable man can deny," he said, "that the true cause of our Poverty and Sunk Condition is the low price of our Country Produce." The remedy, as he saw it, was a bounty of perhaps two shillings per bushel "to be paid for all Wheat which shall be exported to any part of the continent of Europe. . . . the Bounty to be raised by a Land Tax or a Duty on Rum." This, he said, was "the only Means of advancing the Price of Grain, which of late has been so low that the Farmer has been reduced to the Brink of Ruin, his inevitable Fate without some timely Remedy . . . If the Planter or Farmer sinks, the Merchant or Trader cannot swim." He justified the proposed subsidy by the time-honored argument of bounty-seekers of all ages and all nations—"competition of foreign cheap labour." Fortunately for farmers and taxpayers his scheme was not adopted.

Price-fixing, also, has been tried at various times and found unsatisfactory except, possibly, as an emergency measure to combat inflation in time of war. On April 1, 1778, the General Assembly enacted: "Whereas certain persons in this state, instituted by the lust of avarice . . . are assiduously endeavoring . . . to accumulate enormous gains to themselves, to the great distress of private families . . . Be it Enacted, that no person or persons . . . shall ask, demand, receive or take any greater or higher prices . . . than the several prices herein set down."[41] The prices fixed were: wheat, 12 s. a bushel; rye, 10 s.; corn, 7s. 6d.; barley, 10s.; oats, 6s.; buckwheat, 5s.; pork, 9d. to 1s.; beef, 8d. to 1s.; firkin butter, lb., 1s. 3d.; fresh butter, 2s.; wool, lb., 4s.; hay, ton, 4 £.

On April 21, 1778 a town meeting was held at Wilkes-Barre which fixed the prices of various articles of sale and of labor "in accordance with recommendations of the Legislature of Connecticut," which then governed the settlement:[42]

"Labouring woman at spinning wheel, a week	6s.
Winter-fed beef, a pound	7d.
Ox work, for two oxen, per day and tackling	3s.
Men's labour at farming the three summer months, per day	5s.3d.
Good barley, per bushel	8s.
Eggs, per dozen	8d."

Price fixing was ineffective, being "reprobated by many and obeyed by few," as Robert Treat Paine expressed it. In 1779 the Continental Congress endorsed the general policy of price fixing by a closely divided vote but never put it into effect, perhaps for the reason given by James Wilson at that time: "There are certain things which absolute power cannot do." One of these, in his opinion, was to successfully enforce price and wage regulations which run contrary to the fundamental economic law of supply and demand.

WEATHER HAZARDS

Cost of production as well as market price determines the profit or loss of farm enterprises. Some of the more important factors that enter into cost of production, such as capital investment, fertility of soil, cost of labor and cultural skill can be controlled more or less by the farmer; others, such as weather hazards, are largely uncontrollable. Something can be done to mitigate loss from droughts, floods, freezes and frosts, especially in the selection of location and site, but weather remains one of the most potent factors influencing yields and prices. Pennsylvania farmers have been less subject to loss by unfavorable weather than farmers in some other states, nevertheless history shows that this has been an important factor in determining profit or loss. In a letter to Lord North on May 24, 1683, William Penn described Pennsylvania climate admirably: "The weather often changeth without notice, and is constant only in its inconstancy."

Pennsylvania has experienced few disastrous droughts, but very dry summers have occurred occasionally, even when most of the state was still covered with forest. One of the worst droughts was in 1782, when practically no corn matured in the state and the parched meadows produced no hay. Other serious droughts occurred in 1790 and 1825. Extremely hot weather has occurred more frequently than drought. In July 1734 it was reported, "The weather has been so excessive hot here for a week past as has not been known in the memory of man in this country. Many of the harvest people faint or fall into convulsions in the fields and 'tis said in some places a multitude of birds were found dead."[43] In 1816 there was a killing frost every month of the year in some central counties.

Very severe winters have occurred periodically. The winter of 1704-1705 was memorable in this respect. Says Isaac Norris of Philadelphia, "We have had the deepest snow this winter that has been known by the longest English liver here. There is no travelling; all roads are shut. The post has not gone these six weeks; the river is fast and people bring loads over it." Peter Kalm, who was in Philadelphia that winter, adds, "Many stags, birds, and other animals died; the snow was nearly a yard deep."

The winter of 1740-1741 was known as "the winter of the great snow." It lay on the ground four to five feet deep from December 10 to March 13. Horses walked on the crust. Squirrels, grouse and even horses and cows froze to death in the woods. "We hear from Lancaster County that the backcountry inhabitants suffered much from want of bread; that many families had little to subsist upon but the carcasses of deer they found dead or dying in the swamps or runs about their houses."[44]

Periodic floods have caused great damage to river valley farms even when the province was covered with a mantle of forest. The great flood of 1721 destroyed many flour mills along the Delaware and Schuylkill. The first recorded flood of the Susquehanna was in 1734; others occurred in 1758, 1772, 1784, 1786, 1814, 1829, 1846, 1847. Most floods occurred in early spring when the snow melts but there have been several devastating fall floods. The flood of October 1786 was known as the "pumpkin flood" because of the great quantity of pumpkins carried down stream from bottom-land corn fields. The flood of 1847 was known as the "corn flood"; the turbulent waters carried to the sea many thousands of bushels of corn. Livestock and buildings, as well as crops and soil, have been swept away by floods.

"Good Times" and "Hard Times"

The curve of agricultural prosperity in Pennsylvania has many fluctuations, but the average is high. For the two century period considered in this survey Pennsylvania agriculture was more prosperous than that of any other colony or state. Although most large fortunes were made in shipping, manufacturing and merchandising and few from farming, nevertheless the largest and most substantial body of citizens, as a class, was the tillers of the soil. Farmers were poor as compared with the few "captains of industry," but their income was less affected by vicissitudes of the times than that of city dwellers. They were the great stable group in the body politic.

"Good times" and "hard times" are relative terms. Even when economic conditions have been difficult, most farmers have made at least a comfortable living.

When agriculture was primarily self-sufficing it was not quite as subject to economic fluctuations as after 1840, when commercial production primarily for market was well under way.

> The farmer, provident amidst his cares,
> For winter, like the prudent ant, prepares;
> Foreknowing all that summer doth produce
> Is only for consuming winter's use.
> He fills his barns and cellars with good cheer
> Against that dreary season of the year . . .
> Sweet to his taste his unbought dainties are,
> And his own homespun he delights to wear.[45]

By the exercise of industry and sound judgment, impecunious immigrants who settled on good land soon became prosperous. A Lancaster County farmer who died in 1735, only twenty years after he had wrested his farm from the wilderness, left an estate valued at £152; this was a small fortune in those days. There were, however, occasional setbacks, especially for those who depended largely on the sale of their surplus grain. In 1717 James Logan, Secretary of the Province, wrote: "Y^{e} ffarmers are at present under worse circumstances than I have ever known them for these 17 y^{rs} past. . . . Their flour Sells at 8 shillings per 100 lbs and scarce any market."[46]

During the period 1720-1750 farmers generally were prosperous. In 1883 Henry Chapman of Bucks County wrote, "There is a tradition, perhaps in some measure well founded, that there was a period in the history of this community (Wrightstown, Bucks County) styled the 'Golden Age'. It is said to have commenced about 1720, after the forest over a large area had succumbed to the axe of the pioneer and great stretches of virgin soil yielded to the march of the plow-share; when the products and fruits of the earth abundantly supplied all the wants of man and beast . . . where each inhabitant was content with the allotments of Providence; where strifes, especially those of a partisan or political nature, were unknown; where temperance in all things existed; where all were dressed in homespun, the handiwork of the family. . . . The halcyon period is said to have been maintained until about 1750, when disturbing influences entered this Paradise."[47]

In 1786 an "Honest Farmer" of Bucks County published his brief autobiography; it is typical of many others. "My parents were poor and they put me at twelve years of age to a farmer, with whom I lived till I was twenty-one. My master then fitted me off with two stout suits of homespun, four pairs of stockings, four woolen shirts and two pairs of shoes—this was my whole fortune at my setting out in the world and I thought it a good one. I married me a wife—and a very working young woman she was—and we took a farm of forty acres on rent. By industry, we gained ahead fast. I paid my rent punctually and laid by money.

"In ten years I was able to buy me a farm of sixty acres on which I became my own tenant. I then, in a manner, grew rich and soon added another sixty acres, with which I am content. My estate increased beyond all account. I bought several lots of out-land for my children, which amounted to seven when I was forty-five years old.

"About this time I married my oldest daughter to a clever lad, to whom I gave one hundred acres of my out-land. This daughter had been a working, dutiful girl and I fitted her out well, for I told her to take of the best of my wool and flax to spin herself gowns, coats, stockings and shifts. I suffered her to buy some cotton and make into sheets, as I am determined to do well by her. At this time my farm gave my whole family a good living on the produce of it and left me one year with one hundred and fifty silver dollars; for I never laid out (beside my taxes) more than ten dollars a year, which was for salt, nails, and the like. Nothing to wear, eat or drink was purchased, as my farm provided all. With this saving I put money to interest, bought cattle, fattened and sold them, and made great profit."[48] The modest success of this industrious and frugal farmer was representative of the self-sufficing farming of colonial Pennsylvania.

The author of *American Husbandry* reported that about 1750 a man who had purchased 5,000 acres "on the river Scoolkyl [Schuylkill] between thirty and forty miles beyond Reading, near the Kittalany [Kittatinny] mountains" was making fifteen per cent on his investment of £1200; "whereas in England that sum yields 20 or 21 per cent." [49] This was an exceptionably profitable farm; the average return was nearer five per cent.

Before turnpikes, canals and railroads were built, Pennsylvania was under a disadvantage in cost of transportation as compared with river settlements like New York. According to Victor C. Clark, "It was estimated that three day's labor would put the produce of any farm in the colony [New York] at a boat landing, from whence two or three men could navigate to New York a cargo that could be brought to Philadelphia from Pennsylvania back country only by 40 wagons, 160 horses and 80 men. The average cost of carrying a bushel of wheat 100 miles was estimated in New York at two pence and in Pennsylvania at one shilling. The profits of farming in New York were said to exceed those in Pennsylvania by thirty per cent." [50] That this estimate was far from the truth, is evident from the relative agricultural prosperity of the two colonies. The much higher yields secured on the fertile soils of Lancaster and other inland counties more than offset the higher cost of transportation.

Between 1750 and the outbreak of the Revolution farm prosperity fluctuated sharply. The war between England and France, in 1754, stimulated foreign trade and enhanced prices of farm products, especially grain. This inflationary period was of short duration; the reaction was severe. The general agricultural depression of 1760-1775, however, was due more to meager yields from "worn out" soils, inefficient implements of husbandry, poor livestock and unscientific cultural methods than to uncertain markets.

The Revolution sent the prices of farm products into an upward spiral. In 1779, when continental paper currency had begun to collapse, a bushel of corn brought $80 in paper money or $4 in hard money; two years previous it had been worth seventy-five cents. Other farm products experienced similar spectacular advances.

The agricultural and mineral wealth of Pennsylvania were the sinews of war of the patriot cause; without these it would have collapsed. The rich wheat-growing areas of Lancaster and adjacent counties suffered little from contending armies as compared with the devastation wrought in New Jersey, Maryland and Virginia. Long trains of canvas-covered Conestoga wagons drawn by great Conestoga horses rolled eastward from Chester, Lancaster, York, Berks and

Northampton counties carrying flour, salt pork and dried fruit for soldiers and grain and hay for horses. Pennsylvania was called, and justly so, "the granary of the Revolution". On May 28, 1780, Washington wrote to Joseph Reed, "Either Pennsylvania must give us all the aid we ask of her or we can undertake nothing . . . The fate of these states hangs on it." Pennsylvania farmers met this challenge in full measure, in spite of the large Tory and pacifist element in her population.

Pennsylvania farmers have been charged with profiteering during the Revolution. The charge is justified only with respect to a small minority of Tory and a few pacifist farmers. It is true that during the dark days of Valley Forge, from December 1777 to May 1778—the "zero hour of the Revolution"—some German sectarians and Quakers, who were opposed to war on religious grounds, refused to sell their produce to Washington's starving army and take payment in depreciated Continental currency, but sold it to the British in Philadelphia who paid higher prices and paid in gold.[51] But war-profiteers were few indeed as compared with the great body of farmers who sold their produce to the patriot armies at reasonable prices. Most Quakers and German sectarians were neutral; many were animated by the spirit of Joseph Tatnall, who wrote to Washington in 1777, "I cannot fight for thee, Friend George, but I can and will help feed thee."

The keystone position of Pennsylvania in the great struggle was noted by a French observer, Brissot de Warville in 1797: "It was from their farms [Pennsylvania] that the American and French armies were principally supplied. It was from their produce that came the millions of dollars brought from Havana after the year 1780—millions which laid the foundation of the Bank of North America and supported the American army until the peace."[52]

The inevitable aftermath of inflation is deflation. During the period 1783 to 1800, Pennsylvania farmers were at a greater economic disadvantage than at any other time. This was due, not only to deflation, but also to sharply declining yields on impoverished and poorly managed soils, unstable currency and political unrest. The depression was most severe in the older counties but was felt on the western frontier as well. In 1790 an Allegheny County farmer wrote, "To tell the truth, sir, we scarcely think it worth our while to cultivate large farms, since we get little or nothing for anything we raise."[53] Inadequate transportation facilities were responsible for much of the difficulty in western farming.

In the vicinity of Philadelphia the situation was tragic. Many farms changed hands and the sheriff was busy with foreclosures. In 1791 Judge Richard Peters of Philadelphia wrote to George Washington, "You will perceive the miserable state of agriculture in the part of the country I live in. It is bad enough everywhere. . . . I find farming but a bad trade, when capital is calculated upon. There are few men of any talents who cannot employ themselves in any other business to greater advantage . . . Where the farmer and his family do the greater part of the work on their farms, however . . . they can get forward and live well. If calculations were made of all labor being hired, few farms in Pennsylvania would clear a farthing." [54] Judge Peters was speaking of conditions near Philadelphia, where soil depletion was most serious.

The lean years of 1783 to 1800 resulted also from changes in the habits of farmers. A fever of speculation and extravagance swept the nation; even some usually conservative farmers lost their balance. They began to purchase manufactured goods instead of making them at home. These increased expenditures, together with declining yields due to soil exhaustion, brought the sheriff to many a farm home. Skillful and thrifty farmers who were careful not to go into debt came through this trying period without serious embarrassment. In 1790 Benjamin Rush said of German farmers, "They are afraid of debt and seldom purchase anything without paying cash for it."

Although crop yields and profits in the older sections of the state declined sharply, in Lancaster, Berks, York and other "back counties," they were still satisfactory. George Washington must have had these counties particularly in mind when he paid this tribute: "It is but justice, however, to Pennsylvania to declare that her husbandry, though not perfect, is much better [than that of other states] and her crops proportionately greater." [55]

There were other returns from farming, however, besides cash. The great English authority on agriculture, Arthur Young, remarked rather superciliously, "Is it possible that the inhabitants of a great continent, not new settlers . . . can carry on farming as a business and yet never calculate the profit they make by percentage on their capital?" To this Richard Peters of Philadelphia replied, "Our farmers are the proprietors of the soil they cultivate; they gather the honey, shear the fleece and guide the plow themselves. They increase the value of their capital while they labor for their sustenance. . . . By their exertions for their support . . . their farms will increase in many parts of the country ten fold in value in less than twenty years." [56]

The meager income from farming in the older counties about 1790 is evidenced in a report to George Washington by a Bucks County farmer: "I suppose a farm of two hundred acres will, on an average, support twelve head of cattle; of these, I suppose five will be milk cows which will yield per annum one calf each, two of these to be raised and three fattened, the latter worth six dollars. Five milk cows will produce fifteen pounds of butter per month each for seven months, which makes in the whole 525 lbs., at nine cents per lb. $47.25; five months allowed for their being farrow or fattening the calves.

"Twenty sheep may be conveniently kept on a two hundred acre farm; their wool will average forty pounds per year, worth twenty-three cents per pound . . . their increase in lambs, twelve . . . may be worth 1⅓ dollars each . . . Ten hogs may be considered as the average number raised annually on a two hundred acre farm, weighing two hundred net pounds each, at four cents per pound. . . . On an average, ten dozen poultry may be raised worth one dollar per dozen." [57]

Average yields and prices in Bucks and adjacent counties at that time as reported by the same farmer were:

> "Wheat, 10 bu.; occasionally 25-35 bu., @ 90 c. a bu.
> Rye, 10 bu. @ 60 c. a bu.
> Corn, 15 bu. @ 40 c. a bu.
> Buckwheat, 15 bu. @ 30 c. a bu.
> Oats, 20 bu. @ 20 c. a bu.
> Hay, 1¼ tons @ $6.00 a ton."

Arthur Young of England, to whom George Washington sent this financial statement, commented, "The farm of two hundred acres in Bucks County is such as an Englishman would not accept, for it carries on the face of the account, which I have drawn out, a dead loss and not an inconsiderable one; yet the whole labour of a family of five persons is thrown away in order to arrive at that loss." Nevertheless, it is probable that the labor income of this farm supported the family in reasonable comfort.

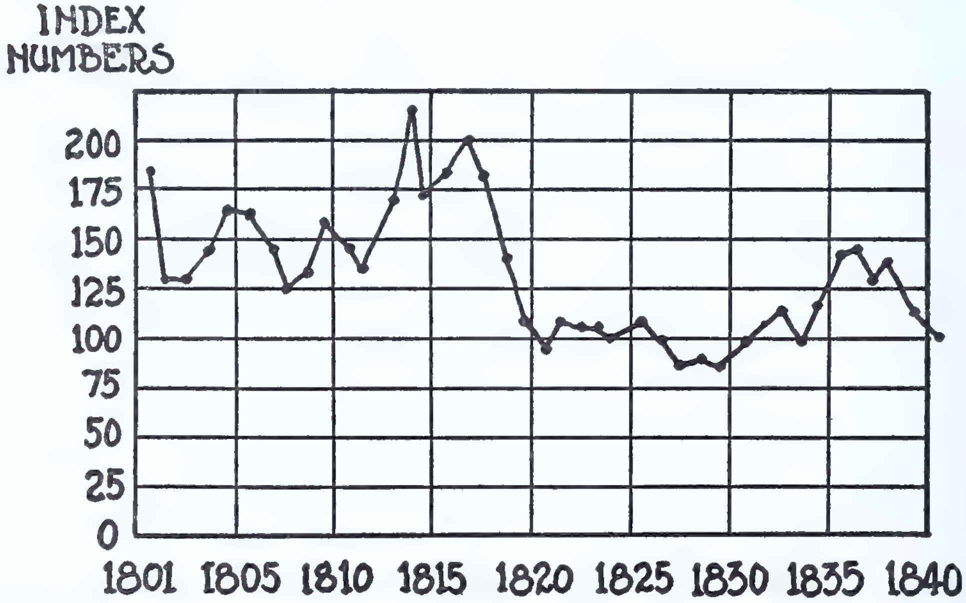
As farming began to change from self-sufficing to commercial husbandry, about 1800, lack of working capital became a more serious problem. Ready money was needed to purchase machinery and supplies and to pay labor. It became necessary to make larger outlays at certain periods and perhaps to anticipate income from sales. The country storekeeper, hitherto the farmers' middleman and banker, no longer could meet their needs.

The banks of that period were unresponsive to the needs of the farmers. They made only short-term loans, such as would serve the purpose of merchants, manufacturers and speculators. Farmers needed loans for six months or a year or more. They distrusted banks, and with good reason, for many of them were not operated on a sound basis. The prevailing attitude of rural people toward banks was expressed by a contemporary farm journal: "A farmer should shun the door of a bank as he would the approach of the plague or cholera; banks are for men of speculation and theirs is a business with which farmers should have little to do." This point of view prevailed until long after 1840. About the only recourse of farmers in need of money was to negotiate a loan from a neighbor.

The half century from 1790 to 1840, was on the whole, the "golden age" of Pennsylvania agriculture. The "New Agriculture," which was based on the more general use of gypsum, lime, red clover, grass, livestock and manure, resulted in more fertile soil, larger yields and more prosperous farming. Competition from the West was not yet serious. With the development of factories, labor shortage was more acute than ever before, but labor-saving machinery began to appear. City and town markets multiplied. The export market was good. A larger number of spacious brick or stone farm homes and commodious bank barns were built during this period than at any other time except, possibly, in the lush period immediately following the Civil War.

But there were some temporary set-backs during this period. The inflationary effect of the War of 1812 in the Wyoming Valley is described by Henry B. Plumb: "The War of 1812 lasted only about two years but it made a great difference in the price of farm produce. Wheat rose from .75 to $1.00 a bushel before the war to $2.00 a bushel in 1816; rye from .75 to $1.25 in 1817; labor for mowing from .67 a day in 1813 to $1.00 in 1817. Values were raised in land, as well, and the people thought these high prices were to last, and they did—until 1818. Many persons bought land and other property on credit; the result to them was generally disastrous. Some struggled along and paid the interest and kept the sheriff off by the closest industry and economy for more than thirty years; and then, having grown old in clearing their property finally from debt, they died." [58]

The inflationary effect of the Napoleonic wars was vividly portrayed by James M. Broom in 1821: "Farmers saw everything rising in value and added farm to farm upon a borrowed capital, calculating upon



Fluctuations in prices of farm products, 1800-1840, showing especially the inflationary effect of the War of 1812 and the sharp depression that followed.

paying in a few years from their own products. . . . The bubble, however, burst. Farmers awoke as from a dream and the golden vision flitted from before their eyes. Ruin and misery followed in the train of their speculations." [59]

Another view of this hectic period is given by Charles Kirk of Bucks County: "Many bought farms at high prices and paid half the price for purchase money. Deflation came and they had to be sold out by the sheriff. Wheat dropped from $2.50 a bushel to seventy-two cents, corn and rye sold for twenty-eight cents and oats for sixteen cents a bushel. In 1820 butter would not bring ten cents a pound. It took four years to reach the bottom and three years to recover." [60] A similar but shorter rise and fall in prices was experienced during and after the financial panic of 1837.

In 1825 John Nevin of Cumberland County wrote: "The Farmer does not flourish. Produce never was known to bear so poor a price—Wheat, 75 cents, Rye dull at 25 cents, Corn at 20 cents. If we convert our Corn and Rye into whiskey and send it to Baltimore it only brings 20 cents a Gallon. Clover seed which used to sell for ten, sometimes fifteen dollars a bushel is now selling at two dollars. . . . Many farms are sold by the sheriff." [61]

TRANSITION TO COMMERCIAL FARMING

The transition from self-sufficient to commercial agriculture, which proceeded rapidly during this period, was not accomplished without loss on certain farms. It was difficult for some farmers to make the radical readjustments required in this change. Habit and tradition are powerful forces; both tended to keep farmers in the old way, producing only what was needed to feed and clothe the family with little, if any, buying and selling. Subsistence farming persisted on many Pennsylvania farms long after it had been outmoded, to the financial disadvantage of these farmers. This was especially true during the decade 1820 to 1830 when farmers who were in the process of transition were caught by falling prices.

The general prosperity of agriculture about 1830 was reflected in an address by Nicholas Biddle of Philadelphia: "The average profit on farming in England is from ten to fifteen per cent. In this country the profits ought to be greater. . . . The greater part of our farmers live well and educate large families." [62]

In 1827 Charles Kirk took his bride to live on a farm in Bucks County. His diary records, "Our cash to start the new home was eight hundred dollars. At the close of the first year we had two hundred dollars to put out at interest. At the end of twelve years we had six thousand dollars." [63] His use of the word "we" emphasizes the vital partnership that exists between man and wife in the successful operation of a farm.

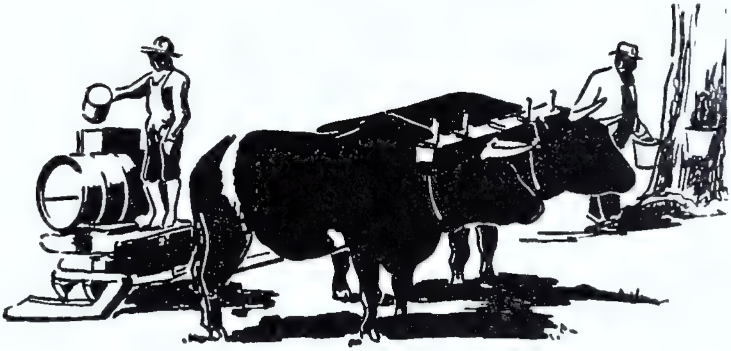
MIGRATION TO THE WEST AND THE CITIES

On less fertile farms, especially hill farms, the point of diminishing returns was reached soon after 1800. The lure of cheap virgin land in the West proved irresistible to many young men whose sires or grandsires had carved homes out of the wilderness with axe and fire. The westward movement was at its height about 1830. Henry B. Plumb records the migration from upland farms of the Wyoming Valley:

"People were emigrating from the township [Hanover, Luzerne County] to the West more rapidly than ever before. Indiana had for some time been receiving most of them but as we come near 1840 Wisconsin becomes the land of promise and the delight of the expectations of the young farmers. There they could get all the land they desired for $1.25 an acre and have no trouble to clear off the woods and brush. It was nearly all prairie land ready for the plow at once and said to be as productive as our river flats. All the talk among the farmers seemed to be 'The West'. Those who had been there and tried it came back to make the final collection on the farms they had sold here, and would say, 'How foolish you all are to stay here and work as hard as you do on these stony and gravelly hills and thin soil, when you can sell this for enough per acre to buy forty acres where you can raise forty bushels of wheat to the acre, and here you can't raise ten.'"[64] These arguments seemed to many unanswerable. Some hill townships were almost depopulated.

The siren call to young men on farms came not only from the West but also from cities and towns. Those who were dissatisfied with or unsuited to farm life or who, very erroneously, felt that farmers are socially inferior to city people because they are engaged in "menial employment," as one supercilious urban dweller put it, went to the city. Said a disgusted farmer in 1839, "Every farmer's son and daughter are in pursuit of some genteel mode of living. After consuming the farm for the expenses of a fashionable, flashy, fanciful education, they leave the honorable calling of their fathers to become doctors, lawyers, merchants, ministers or something of the kind." At nearly every gathering of farmers the burning issue, "How to keep the boys and girls on the farm," was debated at length. But the trend cityward was inevitable after labor-saving machinery made it possible for fewer hands to do the same amount of farm work.

XIII



Gathering maple sap, 1830.

INDUSTRIES ASSOCIATED WITH AGRICULTURE

OF NECESSITY, colonial farmers were engaged in a great variety of operations—in the woods, on the streams and in farm homes and shops—as well as tilling the soil. Few were farmers exclusively; they were rural craftsmen as well. These accessory occupations often interfered with farming, but provided an important supplementary source of income. Part-time farming was much more common then than it is now. Most rural professional men—ministers, school-teachers, doctors, lawyers—depended upon farming for part of their living.

Grist Mills

The first industry to develop in early colonial days and the one most closely associated with agriculture was flour milling. A grist mill was indispensable to every farming community. Water power for turning mills determined the location of most rural hamlets and the sites of many farm homes. Most of the early millers were farmers also.

The first mill in Pennsylvania was erected in 1643 by John Printz, Governor of New Sweden, on Cobb's Creek, a tributary of Darby Creek (now at Seventy-third Street and Woodland Avenue, Philadelphia). In 1702 Campanius reported, "It was a fine mill which ground both fine and coarse flour and was going early and late." In 1846 Benjamin Ferris stated that there still could be seen in the rock by the stream "the holes drilled in which were inserted the supports" of this mill.[1] Probably it was a "Norse" mill like those used in Scandinavian countries at that time. A windmill had been built previously by the Swedes but we have the word of Printz that "it would never work and was good for nothing."

Several other water power mills of the Norse type were erected by Swedes before the coming of William Penn. The second mill was built in 1678 on Mill Creek near the present site of Marylandsville. The records of the Court at Upland for 1678 report, "The Co'rt are of the opinion that Cap't Hans Moemsen ought to build a mill" on a creek later known as Little Mill Creek.

To help recoup his expenses, William Penn reserved for himself, for a time, exclusive right to erect grist and saw mills in the colony. He organized a corporation for this purpose and reserved all water rights to the Proprietary and a few favored associates. In 1682 Penn brought with him from England Richard Townsend and all equipment necessary to construct a grist and saw mill. In "The Testimony of Richard Townsend" he relates, "I set up a mill on Chester Creek which I brought ready framed from London, which served for grinding corn [all grain] and sawing of boards, and was of great use to us." [2]

In 1683 Townsend settled on a farm near Germantown and "set up a corn mill, which was very useful to the country for several miles round: But there not being plenty of horses, people generally brought their corn on their backs many miles." During the next few years several other grist mills were built. Caleb Pusey was appointed the "Governor's miller." In 1687 Thomas Coebourne erected a mill on Chester Creek; in 1688 he built another on Cobb's Creek; and in 1690 still another on Mill Creek. By 1688 there were five mills in Chester County.

Penn's monopoly on milling was not successful. His Secretary, William Logan, wrote, "Our mill [on the Old York Road] proves the unhappiest thing in the country that ever man, I think, was engaged in. If ill luck can attend any place more than another this mill may claim a charter for it." A similar fate met the "Governor's Mill" built at Northern Liberties, on Cohocksink Creek.

In 1698 Penn abandoned his exclusive rights in milling. Thereafter grist mills increased rapidly. In 1760 there were eighty-three in Philadelphia County alone and about as many in Bucks and Chester. At the outbreak of the Revolution eighteen grist mills were operating within ten miles of Lancaster.

Flour milling was the most important export industry of the colony. After the Revolution Philadelphia continued to be the center of the milling industry in America. In 1801 it was reported, "Notwithstanding the periodical scantiness of the water supply, in a distance of about twelve miles [on Wissahickon Creek] there are eighteen merchant and grist mills capable of furnishing at least one hundred thousand barrels of flour per annum." [3]

As forests were felled the flow of streams dwindled. In 1749 Peter Kalm reported, "The water in rivers and brooks likewise decreases in volume. Mills which sixty years ago were built on rivers and at that time had a sufficient supply of water almost all the year long, have at present so little that they cannot run except after a heavy rain or when snow melts in the spring. This diminution of water in part arises from the great quantity of land which is now cultivated and from the extirpation of great forests for that purpose." [4] When water power failed, horse power was substituted.

By far the majority of the early grist mills were built of logs and had a peaked cock-loft from which hung a rope for lifting grain. Later they were built of stone. On one side of the mill a ponderous water wheel, green with slime, turned slowly. Early millstones were made of native granite and were three to seven feet in diameter. All machinery was made of wood, hence the "sound of the grinding was low," in the words of the Scriptures, as compared with modern mills having metal machinery.

The product of early grist mills was whole wheat flour; bolts to separate flour from bran and middlings did not come into general use until after 1750. Until about 1820 mills had vertical over-shot or undershot wheels. Horizontal water wheels set with oblique paddles were used considerably in western Pennsylvania, especially for small operations on farms. These wheels were about eight feet in diameter; they were called "tub wheels" because of the tub-shaped hopper in which the grist was placed. The turbine mill, which was invented by Fourneyron in France in 1823, did not come into use here until after 1840.

Even more primitive types of grist mills were used on the frontier. Small hand mills, differing but slightly from those used by ancient peoples of Asia, were used first; or the grain was pounded into flour with mortar and pestle. Then came horse power mills. "The first effort toward milling in these western counties," says William Hanna, "was the horse mill, where every customer furnished his own power, either horses or oxen. These were sometimes hitched to a sweep by which they pulled and drove the machinery, somewhat on the principle of a threshing machine, only the wheels were all of wood. Sometimes the team was placed on a large tread wheel . . . These sweep and tread mills were unlike the fabled gods—they did not grind fine, but did grind slowly." [5]

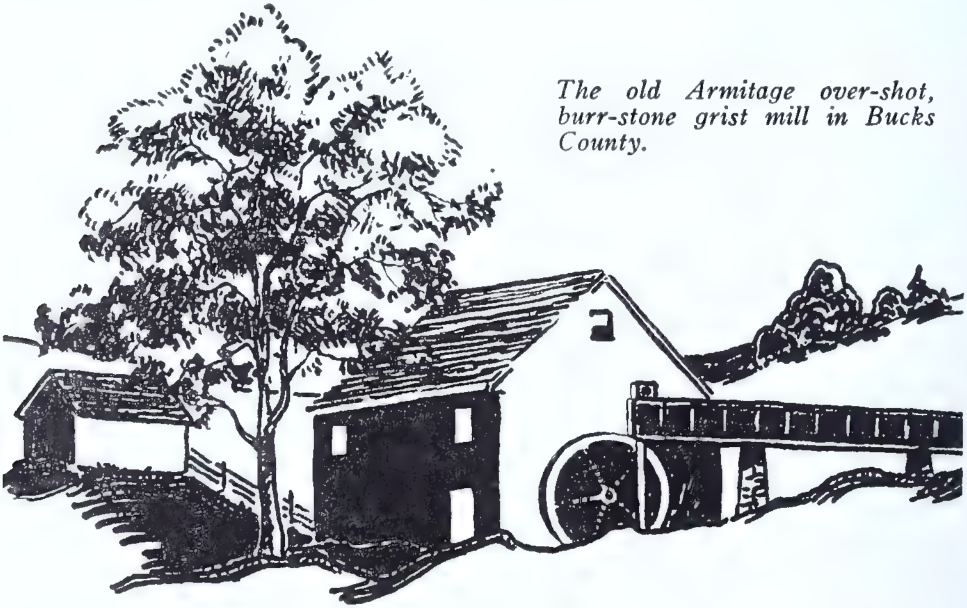
For a farmer lad the trip to the mill with father was one of the high spots of boyhood life on the farm. Usually there were several teams in line, waiting their turn. While the men caught up with neighborhood happenings or talked politics the boys played. In pioneer days grist mills might be twenty or more miles from home, hence it often was necessary to stay at the mill over night. "There were no grist mills in the Wyoming Valley in 1771," says C. Miner. "For bread the settlers used pounded corn. Doctor Sprague, who kept a boarding house, would take his horse with as much wheat as he could carry and go to the Delaware and get it ground. Seventy or eighty miles to mill was no trifling distance. The flour was kept for cakes and was used only on extraordinary occasions." [6]

The miller took one tenth of the grist as toll. When the Wyoming Valley was under the jurisdiction of Connecticut the law provided, "Each owner of a grist mill shall be allowed three quarts out of each bushel of Indian corn he grinds; and for other grains two quarts out of each bushel, except malt, out of which one quart." [7] Usually the miller enjoyed the confidence of his customers, but there must have been some who were not above suspicion; otherwise the saying, "The miller's hogs are always fat," would not have found wide acceptance. Eventually custom work gave way to merchant milling and a fixed charge.

Flour ground with burr stones contains a certain amount of bran and middlings; snow-white "patent flour" could not be ground with these stones. Growing demand for the less nutritious but more attractive white flour tolled the knell of the "Old Mill." The old time country grist mill, with its laboring water wheel and humming burrs has practically ceased to exist. One by one the broad-thumbed millers were forced to open the gates of their races as the competition of great corporation-owned mills drove them out of business.

LUMBERING

The early settlers were, of necessity, lumbermen. Next in importance to the grist mill, which supplied them with food, was the saw mill, which provided them with shelter and supplemental income. It was rare good



The old Armitage over-shot, burr-stone grist mill in Bucks County.

fortune for the colonists that Pennsylvania was so bountifully supplied with this primary natural resource. Forests provided off-season labor for farmers and helped to carry pioneer agriculture far beyond what it would have been if this had been a prairie. There were some drawbacks; the best time to get logs to mill was early spring when the streams were high, which was also the best time for floating produce to market. Farming suffered somewhat, but usually not in proportion to the gain.

In the pioneer settlements before saw mills were common, prior to 1720, boards were sawed by hand. In 1705 hand sawyers were paid ten shillings per hundred for sawing pine boards. The first saw mill in America was built at York, Maine, in 1623. The first saw mill in Pennsylvania was erected by the Swedes about 1663. A list of articles sent to the Swedish colony in 1662 included "iron work for a saw mill." The Swedes had a saw mill on "Carcoon Creek" before 1678 and another at Frankfort, now a suburb of Philadelphia.[8] When William Penn came in 1683, at least four mills built by Swedes were in operation.[9] All early mills were of the "up and down" type; circular saws were not invented until 1805.

Abundance of white pine along the Delaware led many settlers to engage in part-time lumbering. England needed timber for ship building, charcoal for smelting, bark for tanning and ashes for making potash. The colonists soon found that the rich forest resources of the province could be exploited to advantage. Large quantities of staves, headings, planks, boards and shingles were exported to Europe and the West Indies. By 1760 the assessors of Philadelphia County, which then included Montgomery County, reported forty saw mills. As settlement of the interior proceeded, water wheels turned saw mills as well as grist mills on many inland streams. After 1840 lumbering became more specialized—a business by itself instead of a side line of farming. It also became more centralized; less lumber was handled by small local mills and more by a few large mills.

Pioneer saw mills, which were mostly farmer-operated, were small enterprises, located on streams in the midst of large tracts of timber; when these were cut they were moved to other locations. In 1705 a Pennsylvania mill owner thus described his plant: "It occupies a building 32 by 70 feet . . . We can cut with one saw seven or eight hundred feet of inch boards a day and more sometimes when the water is high."[10] Such a mill was expected to gross £400 a year. A single up and down saw was used. Forty years later the average cut was 2,000 feet a day.

As demands for lumber increased after 1750 much timber was rafted down the Delaware to supply mills, ship-building yards and wood-working industries of Philadelphia. There was excellent oak for ship timbers along the Delaware; some trees were free of branches for sixty feet. "The first raft to navigate the Delaware," says W. H. H. Davis, "started from Cocheston, about forty miles above Port Jervis, in 1746 under the management of one Skinner. On reaching Philadelphia, after a hazardous run of nearly 200 miles, such importance was attached to the event that he was given the 'freedom of the city.' The first raft consisted of six pine logs seventy feet long, to be used as masts of ships." [11]

Between 1750 and 1775 some very large rafts navigated the Delaware. "On the lower Delaware," says J. Herbert Walker, "great raft-ships with masts, booms, yard-arms and rudders were constructed and sent across the Atlantic under canvas—mainsail, staysail, foresail, topsail, jib and spanker—to England and France chiefly. The last of them was launched in 1775 at Kensington." [12]

Another view of rafting on the Delaware is given by a participant: "The farming of the rivermen was on a small scale; it was only a side line with them. Hay and grain were raised to partly feed their working cattle . . . Their crops in, the farmer, his boys and his hired men hied them off to the woods. . . . On a level stretch at an eddy, logs were lashed together before a rise in the river. Slender saplings, two to four inches in diameter, were cut into lash poles, because ropes were scarce and dear; these, with pins and withes, were laid across the logs and fastened to them with wooden staples called bows, made of ash, and with withes. From two to four oars completed the outfit."

"Rafting on the Delaware," says B. F. Fackenthal, "was at its height in 1840-1845 and began to decrease in 1855. The season was generally about four weeks, during the spring freshets. For the first two weeks nearly all rafts were of sawed lumber and during the last two weeks mostly of logs. During the height of the season as high as twenty rafts were in sight at one time." [13]

Wood-Using Industries

In colonial days domestic demand for lumber was far greater, in proportion to the population, than it is now since iron and other metals were scarce and expensive. Philadelphia early acquired prominence in wood-using industries. Of these, cooperage was by far the most important. Staves and headings were used in large quantity to make barrels, tubs and firkins used to export flour, bread, salt pork, beef, butter and other farm products. There also was a brisk export demand for cooperage. Red and white oak and elm were used most for making staves. Cooperage was an important farm enterprise in the winter months. Staves and headings were made by hand until about 1875 when machine-made stock displaced hand-made stock.

Another winter job for men and boys on the farm was making rived or shaved shingles. They were split with a beetle and wedge; a good workman could make 1,000 a day. Cherry, birch, red maple and walnut timber was used for making furniture, red maple for making spinning wheels and laurel for making weaver's shuttles.

Two lumber by-products, potash and pearl ash, were an important source of income to pioneer farmers, especially those who were so situated that their timber could not be marketed to advantage as lumber. Some farmers asserted that they derived enough income from these products to pay the cost of clearing new ground. Potash was a combination of various crude salts of potassium, mostly potassium carbonate, resulting from burning wood. It was used in making soap, scouring wool, bleaching and dyeing cloth, making glass and for other purposes until about 1856, when the great potassium deposits at Strasbourg, Germany, began to be exploited. There was a steady European demand for potash and pearl ash, especially from England.

Equipment needed for making potash was within the reach of every farmer. Lye, made by leaching wood ashes, was boiled down in great iron kettles and evaporated to dryness. The resulting crude "black potash" could be sold, or it could be refined into pearl ash. In 1805 pearl ash sold for $200 to $300 a ton. Being highly concentrated, pearl ash could be transported to market from distant farms.

Charcoal was another important forest-farm product until coal and coke supplanted it about 1840. Blacksmiths, metal workers and other craftsmen requiring high temperatures used charcoal exclusively and it was essential in smelting iron ore. Much of it was made by farmers. Hardwood, preferably elm, was cut into three to five foot lengths, seasoned and laid in a pile about twenty feet wide and twenty feet high. This was covered deeply with earth and then fired, so that it burned without access to air. Burning required ten days. A cord of wood made about thirty bushels of charcoal which sold for fifteen to thirty cents a bushel.

Tanbark was another important forest-farm product. It was a by-product of clearing new ground for farming and of lumbering. The bark of oak and hemlock trees was peeled off in June and July when it loosened easily from the wood. Cylinders of green bark, about four feet long, were dried and stacked for the use of tanneries and the peeled trunks taken to the saw mill. Tanning was a rural community enterprise until about 1830 when it gradually became concentrated in a few large plants.

As settlement progressed westward, beyond the Susquehanna River, lumbering became relatively more important as a side line of agriculture. By 1840 most of the state east of the Blue Ridge had been denuded of its virgin forest except scattered farm woodlots.

Rafting on the Susquehanna began in 1805 when David Litz, of Clearfield Bridge, took a raft of timber down the river; and in 1807 when Phelps Brothers floated a raft from Oswego, New York to Port Deposit, Maryland, and sold it for twenty-five cents a cubic foot. Rafting reached its zenith between 1833 and 1840; by 1870 it had practically ceased. In 1820 it was recorded that 1,638 rafts containing 25,000,000 feet of lumber went down the river.

The forests of central and western Pennsylvania were mixed hardwoods and conifers. White pines and hemlocks predominated in the higher parts of the Alleghenies; hardwoods—oak, beech, birch, maple and walnut—were found in increasing numbers as the slope decreased westward. The timber of the Susquehanna drainage basin was marketed at Port Deposit or Havre de Grace, Maryland, where it was redistributed to Baltimore, Philadelphia and New York. In addition to logs and sawed lumber, many ark-loads of shingles floated down the river.

Navigation of the shallow, rapid and rocky Susquehanna was a hazardous undertaking. Many rafts broke upon rocks; drownings were frequent. For this reason and because of the long distance, most rafts were manned by professional rivermen, not farmers. Farmers took their rafts down the tributaries of the river—Moshannon, Clearfield, Bald Eagle, Sinnemahone, Chest, Pine and other creeks—and delivered them to rivermen. After 1840 lumbering passed from farmers to great lumbering companies. The first sawmill at Williamsport, capitol of the central Pennsylvania timber empire, was erected in 1838, and the great Williamsport "boom" was completed in 1849. The period from 1840 to 1900 witnessed an orgy of ruthless forest destruction in central and western Pennsylvania such as had not been surpassed anywhere in America, with no consideration whatever for forest regeneration.

Lumbering in the early history of Clearfield County is representative of other parts of central and western Pennsylvania. Early settlers found the county covered with forest except for a few "clear fields," the former sites of Indian villages. Lumbering was a necessary preliminary and accompaniment of farming. Beginning about 1820, numerous small saw mills were erected on all the larger streams. Logs were "square hewed" on four sides with the axe or were squared in saw mills. They were rafted to market by farmers or sold to dealers who made rafting a business. From 1820 to 1850 lumbering was the main occupation of the settlers; thereafter agriculture became more important.

Rafting was succeeded by log drives and great log booms on the rivers. Lewis C. Aldrich describes these: "Instead of rafting, the logs were floated to Williamsport where the river was boomed to receive them. This deprived the rafters of their living. An armed party of rafters attacked and drove the floaters from Clearfield Creek after which floating was abandoned on that creek but continued elsewhere . . . On streams large enough for floating and rafting all lumbermen had equal rights, as the larger streams had been declared by the Legislature to be public highways." [14] After 1850 floating largely supplanted rafting throughout central Pennsylvania, but some rafts were driven as late as 1875.

Pioneer farmers of Clinton County, also, were lumbermen. Says D. S. Maynard, "Each settler would cut and make a small raft of timber near to the water and with a hickory halyard for a rope start on his journey down the river. First class pine timber in those days sold for three to five cents per cubic foot in Marietta and even less. The settler, having disposed of his raft, would start homeward and with the proceeds lay in a supply of necessaries for the coming year. These supplies were generally pushed up in large canoes." [15]

After 1830 the hazards of rafting were lessened somewhat by dividing the river into operating districts. Each crew ran rafts only in one district—that part of the river with which it was most familiar. Upriver crews took rafts to Lock Haven; from there other crews took them to Marietta where a third crew took them to Port Deposit.

From the tributary valleys timber on the western slope of the Alleghenies was rafted down the Allegheny, Ohio and Mississippi rivers. Tionesta Creek and its tributaries were heavily stocked with timber. Says J. Herbert Walker, "This great forest in the counties of Forest, Clarion, Warren, Elk, McKean and Potter contained a body of hemlock timber of gigantic growth, the largest of its kind in the world . . . There were a billion board feet of hemlock, 300,000,000 feet of pine, 200,000,000 feet of oak, ash and cherry, and some 600,000 tons of hemlock bark . . . It was estimated that the original stand of white pine ran 20,000 to 40,000 board feet to the acre, and occasionally 100,000 feet." [16]

After the purchase of Louisiana from Spain in 1805, the first flatboat of white pine lumber from Brokenstraw Creek, Warren County, was floated to New Orleans where it was sold for $40 a thousand, which was double the price at Pittsburgh. Tempted by these high prices, other flatboats and rafts followed. The crews walked back through the wilderness, 2,000 miles, which was an even more hazardous experience than the river trip. Rafting to New Orleans reached its peak between 1830 and 1840.

Rafts originating on small streams had a steering oar or sweep at each end. It was thirty-five feet long and was made of two-inch plank; two men were required to operate it. At Pittsburgh many small rafts were combined into a large Ohio River raft; this often covered two acres and contained 1,500,000 feet of lumber.

The vast white pine and hemlock forests of Potter County were first marketed about 1815 when Benjamin Burt dammed the Allegheny and built an over-shot saw mill near the present site of Burtville. Before the era of big lumbering companies in that region began, about 1840, lumber from this and other mills was rafted down the Allegheny to Pittsburgh.

Inter-relation of lumbering and farming is indicated by W. J. McKnight of Jefferson County: "In 1840 lumbering was one of our principal industries. Everything had to be rafted to Pittsburgh. The saw mills were nearly all 'up and down' mills. The 'thunder gust' mills were on small streams. All were driven by flutter wheels and water. It required usually but one man to run one of these mills. He could do all the work and saw from one to two thousand feet of boards in twelve hours. Pine boards sold in Pittsburgh then at three and four dollars per thousand; clear pine at ten dollars . . .

"We usually had three floods on which to run this lumber—spring, June and fall. At these times rafts were plenty and people scarce. Whenever a flood came everybody had to assist to run the rafts; the boy had to leave his school, the minister his pulpit, the doctor his patients, the merchant his yardstick and the farmer his crops. There was one great compensation to this—nearly everybody got to see Pittsburgh . . . Every farmer ran at least one square timber raft. It was timber trade that made the pioneer prosperous." [17]

Clarion River was a famous but very dangerous rafting stream. Lumbering began in the vicinity of Ridgway, Elk County, about 1827 but the first saw mill was not erected until 1836. Squared logs and saw lumber were rafted down the Clarion and Allegheny rivers to Pittsburgh and towns along the Ohio. These rafts were 130-150 feet long and 20-24 feet wide. Not infrequently the crew was unable to turn the heavy raft in the swift-running current in time to prevent it from being broken on rocks; then they were lucky to escape with their lives.

By 1840 the devastation of central and western Pennsylvania forests by big lumber companies was in full swing. By 1890 "a desert of five million acres" remained, mute witness to the greed of man. It has been estimated that during the 200 years of forest exploitation in Pennsylvania more than fifty billion board feet of white pine were lumbered, an equal amount of hemlock and two hundred billion feet of hardwood. Much of this princely endowment was squandered without regenerative measures; nevertheless it contributed largely to the development of Pennsylvania agriculture.

MAPLE SUGAR

Sugar maple trees were abundant in virgin forests throughout the state and were an important source of income to farmers. Pioneer families depended on maple sugar and wild honey for "long sweetening" until after 1820, when cane sugar became available in quantity and at a lower price.

Sugar making had been practiced by Indians for centuries before white settlement. It came at a season, usually February or March, when there was little else to do on the farm; logging had been finished and it was too early to plow. Frosty nights followed by sunshiny days were ideal "sugar weather"; two weeks of it made a good sugar harvest. In a very early spring the buds might start before the flow of sap was well under way; this resulted in bitter sap and poor sugar.

A farmer with a large family might tap 500 trees yielding about four pounds of sugar per tree. The average family, however, made 300 to 400 pounds a season. Sugar could be bartered at the country store at the rate of eight to sixteen cents per pound. Most of it was used by the family; then, as now, hot biscuits or buckwheat cakes smothered in maple syrup were epicurean delights.

In early colonial days of Pennsylvania Indian methods of sugar making were used. A notch was cut in the trunk four or five feet from the ground. Into this a semi-circular basswood spout was set to lead the sap into a butternut trough holding about ten quarts. Sugaring off was done on a level spot twelve to eighteen feet square. Two strong forked saplings were set in the ground twelve feet apart. Three to five kettles, each holding about twenty-five gallons, were hung from the cross-piece. Sap was carried from troughs to kettles in two large wooden buckets hung on a sap-yoke across the neck. Gathering enough dry wood to keep the fires going day and night was hard work. If there was a "good run of sap" the family would stay in camp several nights.

Sugaring off was a pleasant diversion for farm boys and girls. The last afternoon and evening in camp was a neighborhood frolic. Sled loads of girls came to taste the new sugar, to make maple candy by dropping hot syrup on snow, and to have an evening of merriment.

W. J. McKnight recalls the sugar camps of his boyhood days, about 1825: "The camp was a small cabin made of logs, covered with clapboards and open at one end. . . . Before the opening in the cabin four wooden forks were deeply set in the ground and on them rested a strong pole. On the pole was hung the hook of a limb, with a pin in the lower end to hang the kettle on. An average camp had about three hundred trees; it required six kettles averaging about twenty-two gallons each to boil the water from that many trees. The trees were tapped . . . with a three quarter inch auger, one or two inches deep. In this hole was put a round spile about eighteen inches long made of sumach or whittled pine, two spiles to a tree. . . . There were from one to three storage troughs, made of cucumber tree or poplar; each trough held from ten barrels upward. The small troughs under the trees were made of pine and cucumber and held from three to six gallons. We hauled the sap water to the storage troughs with one horse and a 'pung' (sled).

"In the fireplace was a large backlog and one a little smaller in front. The fire was kept up early and late with smaller wood. We boiled the water into a thick syrup, then strained it through a woolen cloth, while hot, into the syrup barrel . . . This sugaring off was done on cloudy or cold days when the sap would not run. One barrel of sugar-water in the beginning of the season would make from five to seven pounds of sugar . . . The sugar was made in cakes or 'stirred off' in a granulated condition; it sold for six to twelve cents a pound." [18]

About 1790 a few sanguine and overly speculative people dreamed of producing enough maple sugar to supply the world with sweetening. Some were zealots who sought to drive cane sugar off the market because slave labor was used in its production. To them, the sugar maple tree became an object of veneration. Said Brissot de Warville in 1792, "Whenever there shall form from North to South a firm coalition, an ardent emulation, to multiply the produce of this divine tree, and especially when it shall be deemed an impiety to destroy it, not only America may supply herself but she may fill the markets of Europe with sugar, the low price of which will ruin the sale of that of the Islands [cane sugar], a produce washed with the tears and blood of slaves." [19]

With this high purpose in view, in 1791 the Holland Land Company, a group of Dutch capitalists, authorized its agent in America, Theophile Cazenove, to purchase 10,000 acres of land in western New York that was heavily stocked with sugar maple. Robert Morris of Philadelphia was their American adviser. In 1791-1792 the Company sent John Lincklaen, a Hollander, to appraise the opportunity for sugar making in New York and Pennsylvania. He reported that at Throckbottom (Wyoming County) he "met John Jhones . . . He proposes to tap 2000 trees next spring . . . Mr. Nicholson has 12,000 acres, 3,000 of which bear maple trees." [20] On Tunkhannock Creek in Wyoming County he "passed a tract of land extremely rich & covered with fine maple trees—we measured some of which the circumference was 14 feet, which means about four and a half feet in diameter." It was confidently expected by the promoters that the New York tract would yield 1,500,000 pounds of sugar a season. The project, however, was a miserable failure; it was abandoned after the first season with a loss of $15,000.

In 1793 the Society for Promoting the Manufacture of Sugar from the Sugar Maple Tree was organized in Philadelphia. James Wilson of that city was its chief promoter. Tench Coxe, also of Philadelphia, was equally enthusiastic about the outlook for commercial maple sugar production. In 1794 he said, "It has been proved by many fair and careful experiments that it is in the power of a substantial farmer who has a family about him easily to make twelve hundred weight of maple sugar every season, without hiring additional hands or utensils . . . This may be reckoned at one hundred and fifty dollars . . . There are some millions of acres bearing the sugar maple in Pennsylvania and adjacent states." [21]

The dream became a contagion. Dr. Benjamin Rush of Philadelphia was even more sanguine. In the presence of Alexander Hamilton he conducted an experiment which convinced him that maple sugar was as sweet as West Indies cane sugar. In 1791 he stated in a paper before the American Philosophical Society: "The resources for making a sufficient quantity of this sugar, not only for the consumption of the United States but for exportation, will appear from the following facts. There are in the states of New York and Pennsylvania alone at least ten million acres which produce the sugar maple tree in the proportion of thirty trees to an acre. Now supposing all the persons capable of labor in a family to consist of three, and each person attends 150 trees, and each tree yields five pounds of sugar in a season. The product of the labor of 60,000 families would be 135,000,000 pounds of sugar. Allowing the inhabitants of the United States to compose 600,000 families, each of which consumed 200 pounds of sugar in a year, the whole consumption would be 120,000,000 pounds in a year, which would leave a balance of 15,000,000 pounds for exportation . . . I am led to expect that a material part of the general happiness which Heaven seems to have prepared for mankind will be derived from the Manufactory and general use of maple sugar."[22] This Arabian Nights' Dream was about on a par with the silkworm craze of later years.

The over-sanguine Dr. Rush could not have foreseen the development of the cane sugar industry in this country. At the very time he was reading his essay Antonio Mendez of New Orleans was making the first granulated cane sugar produced in America. By 1820 the cane sugar industry was firmly established; not long after beet sugar also was marketed in quantity. Then the dream of a great commercial maple sugar industry envisioned by Rush and Coxe faded away. Maple sugar making continued to be a profitable side line of general farming, seldom a business by itself.

In 1814 the General Assembly denied a petition for a bounty to encourage maple sugar production and stated, "The high price and great demand for sugar are incentives sufficiently powerful to promote its manufacture."[23] A few farmers who were not so fortunate as to possess a good "sugar bush" planted groves of maples and waited for them to come into production. Said a Washington County farmer in 1824, "To plant out a sugar camp to the best advantage let the trees be thirty-three feet apart, or forty-six trees to an acre. One acre thus planted will, in a good season, yield 130 pounds of sugar."[24] In 1840 Somerset, Greene, Crawford and Warren counties led in maple sugar production.

OTHER SUSTAINING INDUSTRIES

In early pioneer days Pennsylvania was well stocked with deer, elk, bear, wolves, fox, beaver, otter, mink, muskrat and other animals valued for meat, fur or hides. The fur trade was not only an incentive to exploration and migration but also was an important source of income for farmers, especially on the frontier. Many pioneer farmers depended fully as much on hunting and trapping for a living as on tilling the soil. Furs and peltries were a standard medium of exchange in bartering for goods at the country store.

Pioneer families used skins, especially deer skins, for clothing. At first they used Indian methods of dressing leather to make it soft. Indians used smoke, kneeding and pounding in the curing process but were not acquainted with the tanning properties of oak and hemlock bark. Tanneries were established by the settlers in nearly every rural community to meet local needs for leather garments and shoes. Most of these were operated by farmers.

In colonial and early national days the iron industry of Pennsylvania was closely associated with agriculture. This was especially true in the ridge and valley region of central Pennsylvania, where small deposits of iron ore occurred in conjunction with the other essentials for iron making—forests to supply charcoal, limestone for flux and water. In 1820 there were thirteen iron furnaces in Centre County alone.

Charcoal was the only fuel used in the reduction of iron ore until 1838. Great quantities of wood were required; from 100 to 150 bushels of charcoal were used in smelting a ton of iron. Furnaces secured much of the charcoal and wood to make charcoal from farmers. The iron masters not only bought large tracts of woodland for charcoal making but also bought wood leases from farmers; they cleared the land of trees within a stipulated time and then turned it back to the owners. Farmers cut wood during the winter months for furnaces which also employed their horses and oxen and provided local markets for produce.

The iron furnaces of central Pennsylvania were quite similar in organization to the great plantations of the Old South; they were practically self-supporting principalities. Most of them were remote from settlements. They comprised 5,000 to 30,000 acres of woodland, orebanks and limestone, together with furnaces, forges, charcoal houses, offices, stores, grist mills, saw mills, blacksmith shops, schoolhouses, dwellings, farms, sometimes a church, a common bake oven, and all equipment necessary for a self-supporting community. The iron master or his Manager lived in the "Big House"; his word was law on all community matters, business or social. A large force, perhaps more than a hundred, was employed in cutting wood, burning charcoal, digging ore, quarrying limestone, operating the furnace and farming. Many acres were needed to produce food required by the workers and their families. The iron was packed out on mules or floated down the creeks and rivers in arks. Iron furnaces of charcoal-burning days were a colorful feature of rural Pennsylvania.

In Pennsylvania prior to 1830 the mining of both anthracite and bituminous coal was chiefly by farmers. Wherever a productive coal seam cropped out on his land the farmer opened a surface or strip mine and operated it when farm work was least pressing. After following the seam so deep into the ground that water would not run out of the excavation the mine was abandoned; sometimes hand pumps were used but this was expensive.

After 1830 undermining largely succeeded surface mining and a steadily increasing proportion of coal was dug by full time employees of great industrial concerns; but farmers continued to open and operate small mines on their own property. In 1812 John Lorain of Philipsburg reported, "Stone coal abounds in every direction . . . It lies in large banks near the surface and is so readily come at that the farmers on Clearfield Creek already have begun to dig and export it." [25] In 1832 it was stated, "The coal business [of Clearfield County] is still in the hands of the farmers and mechanics, who devote the winter and spring to mining it and boating it to market." [26]

During the era of domestic manufacture, prior to 1800, farmers participated in a great variety of other trades and crafts on a part time basis. They were blacksmiths, tinsmiths, coppersmiths, saddlers, shoemakers, tailors, butchers, masons, carpenters, cabinet makers, wheelwrights, storekeepers, millers, ferrymen and ministers. Many farm families, especially Germans, were engaged in making hats, clothing, shoes, ropes, pottery, clocks, brooms and other articles in their homes. There was much part-time farming associated with domestic manufacture.

The close relationship between agriculture and industry during the period of domestic manufacture was set forth by Tench Coxe in 1794: "That part of the tradesmen and manufacturers who live in the country generally reside on small lots and farms of one to twenty acres, and not a few upon farms of twenty to one hundred acres, which they cultivate at leisure times with their own hands, their wives, children, servants and apprentices and sometimes by hired labourers; or by letting out fields for a part of the produce to some neighbour who has time and farm hands not fully employed. This union of manufactures and farming is found to be very convenient on grain farms but it is still more convenient on grazing and grass farms, where a part of almost every day and a great part of every year can be spared from the business of the farm and employed in some mechanical handicraft or manufacturing business." [27]

With the advent of commercial farming, about 1840, farmers gradually relinquished other occupations and became agricultural specialists.

Devastation from lumbering and fire.

XIV

VENERATE THE PLOUGH.
THE AGRICULTURAL SOCIETY OF PHILADELPHIA

AGRICULTURAL LEADERSHIP

PROGRESS in agriculture is derived from practice as well as from research. Alert farmers, even those who have little knowledge of the science that underlies their practice, frequently make important contributions. During the two hundred year period under discussion, especially prior to 1785, most advances were from this source. With the opening of the nineteenth century, applications of the natural sciences to agriculture became more numerous and more impressive. Not until after the organization of the Land-Grant Colleges in 1862 and the State Agricultural Experiment Stations in 1887 was there general recognition of the dependence of progress in agriculture on scientific research and organized instruction.

Conservatism and Superstition

Early Pennsylvania farmers, as a group, were conservative. They were slow to accept new ideas and adopt new practices. Frequently this kept them from becoming more efficient but almost as frequently it kept them from being lured into disastrous speculation or ill-advised experiment. One reason why so much of agricultural progress in the period from 1785 to 1840 was the result of activities of "gentlemen farmers" of the Philadelphia Society for Promoting Agriculture was that these wealthy patrons of agriculture could afford to try new methods and to make mistakes. Most working farmers could not; they gave unqualified approval to the first line of the couplet,

> Be not the first by which the new is tried,
> Nor yet the last to lay the old aside—

but had mental reservations about the second line.

Benjamin Franklin, who was an active advocate of progressive agriculture, often was impatient with the reluctance of farmers of his time to change traditional practices or to take the risk involved in experimenting with new methods. He shared the opinion of Charles Read, a contemporary, who wrote to Jared Eliot of Connecticut in 1749, "If the Farmers in your neighborhood are as unwilling to leave the beaten road of their Ancestors as they are near me it will be difficult to persuade them to attempt any improvement. Where cash is to be laid out on a probability of a return they are very averse to running any risk at all, or even expending freely, even where a gentleman of a more public spirit has given them ocular demonstration of success." [1]

Franklin's impatience with the conservatism of most farmers may have been prompted by a recent rebuff. He had purchased fifty copies each of the first two of Eliot's celebrated "Essays on Field Husbandry" with the purpose of distributing them among farmer friends. [2] They declined the proffered gift, saying, "We want no information on husbandry; we know all about it. Give us labour; we want not your books of information."

In the absence of science, tradition—the very large body of accumulated experience of generations of farmers—and superstition were the rule and guide of agricultural practice. This was not restricted to any one of the several nationalistic groups that settled the colony. The early Swedes were as superstitious as the Germans who followed them. They believed, for example, that at midnight on Christmas Eve all cattle in barns were given the power of speech for a brief period—but no man dare be present to witness this supernatural event. When they sold a good cow they kept a small bunch of her hair so that good luck would not leave the farm with the cow. They thought that rain could be prevented from falling at harvest time by saying the Lord's Prayer backward.

Superstition was especially rampant among farmers of German descent. Most of it had been brought from Europe and dated back to the twilight of German history. It was a curious survival of the mythology of the ancient Teutons who worshipped Odin and Thor in the dense forests bordering the Rhine and Elbe.

The most generally accepted of these superstitions was moon farming. This goes back to ancient civilizations around the Mediterranean when astrology, or the appearance of the heavens, was thought to play a major part in determining the success of all human affairs, including farming. Almanacs were the chief repository of this mystic "science." They took proverbs, adages, omens and superstitions that had been handed down from generation to generation by word of mouth and gave them an astrological background.

During the seventeenth and eighteenth centuries the moon was considered by many Pennsylvania farmers to be the most important factor in successful agriculture. Its waxing and waning, which has some connection with the movement of the tides, was believed to exercise a determining influence over all phenomena of nature, especially animal and vegetable life. This was not only a cardinal article of the faith and practice of farmers, it also was accepted by many of the learned men of the time. The Reverend Jared Eliot, distinguished author of the first great American book on agriculture, states that he had found from experiment, "certain Times for cutting Bushes which are more effectual for their Destruction than any yet discovered. . . . The Times are in the Months of June, July and August, when the old moon that Day is in the sign of the Heart." [3]

Reverend Samuel Deane, Vice-President of Bowdoin College and author of *The New England Farmer,* advised, "Gather apples on the day of the full of the moon." [4] Israel Huebner, a learned professor of mathematics at the University of Erfurt, Germany, was more explicit. Said he, "On the tenth of March, 1698, at thirty-one minutes past seven at Night, the Moon is in Mid-Heaven, with thirty-one Testimonies. At which time you must cut or gather the Herbs and Roots of the Moon. You may provide yourself half an hour before-hand, but the Herb or Root must be cut or gathered at thirty-one minutes past seven and put into a pale white or grey colored Silk bag, and kept until Occasion serves." Such was the agricultural science of the seventeenth century.

Having this questionable support from the learned and ministerial sources, it was natural that many laymen should have implicit confidence in moon farming. German farmers were guided by "Kalender Aberglaude," almanac prognostications based on the phases of the moon and other celestial bodies, and by the signs of the Zodiac. They believed that crops should not be sown or harvested, fruit trees pruned, firewood cut, weeds destroyed, bacon cured, fences built, manure spread and practically all other farm and home operations undertaken except when the moon was in a propitious phase. If they were ready to do the work, but the moon was not favorable, it was necessary to wait until the moon should say, "Proceed."

Crops were thought to be particularly amenable to lunar influence. Grain should be sown in the waxing of the moon and if possible in the sign of the Twins. Wheat sown in the waning quarter would be likely to smut. Apples picked in the dark of the moon would rot quickly, regardless of the conditions under which they were stored. Pole beans must be planted in the up sign else they would refuse to climb the poles. All crops the edible parts of which grow below ground, as the potato, should be planted only in the "dark of the moon"; crops the edible parts of which grow above ground, as corn, in the "light of the moon."

The animal as well as the vegetable kingdom was thought to be profoundly influenced by the Queen of the Night. If hogs were slaughtered in the waxing of the moon, the pork would swell in the barrel. Cattle slaughtered in the full of the moon would have juicier meat than if killed in the waning of the moon. Calves weaned during the full moon developed into heavy-milking cows. If a goose was set during the new moon the goslings would be blind. Among other manifestations of lunar power was the inevitable effect of shingling houses and barns at the wrong time; if an unwary farmer did this when the horns of the moon pointed upward, the shingle butts would soon turn upward.

Moon farming continued until after 1840. Between 1820 and 1840 there were many heated debates in farm journals and in meetings of agricultural societies between "moon-believers" and their more realistic opponents. Said the editor of *Farmers' Register* in 1833, "Although long and well-conducted experiments by scientific men have completely refuted the popular belief in the influence of the goddess Luna upon sublunary things, many still adhere to it." And some still do!

The signs of the zodiac were, from very ancient times, thought to be equally infallible guides to successful farming, although sometimes they were in conflict with lunar authority. Farm children were taught to recognize these signs in the almanac and their significance as applied to agriculture. Crops were planted, fences built, hens set, hogs slaughtered, vinegar barrels filled and many other farm operations performed not only as dictated by the moon but also by the signs of the zodiac. Hens should be set only under the sign of the Virgin and on an odd number of eggs. Cider should be drawn off for vinegar only in the sign of the Lion. Livestock should be bred, so far as was practicable, only under propitious signs of the zodiac; these were believed to have a marked influence on the vigor, productivity and disposition of the progeny.

The benign lunar influence extended to humans also. In the great family Bible was recorded the date of the birth of each child and the sign under which he was born. If the child was born under the sign *Steinback* the fates would be kind to him; if under *Scorpion,* he would go through life under a heavy and inescapable handicap.

Another common superstition was that certain plants could change from one species to another, especially wheat to chess or cheat *(Bromus secalinus)*. The "Transmutation War" was at its height about 1820. Many farmers claimed that cheat is only degenerate wheat, the result of unfavorable soil or season, or of disease. Letters recounting this observation poured in to farm journals. Edward Ruffin, editor of *Farmers' Register,* made carefully controlled experiments in cooperation with a number of unprejudiced farmers; the findings were negative, yet many farmers clung to this fantastic notion until long after 1840. The fact is that cheat merely took possession of the ground when conditions were unfavorable for wheat, especially winter-killing, as any other weed would.

One of the most curious and persistent superstitions, the origin of which is lost in antiquity, was that of the water witch or divining rod. This was used mainly for locating underground water in digging wells but was thought to be effective, also, in locating minerals and even in finding hidden treasure. The witch was a small forked twig, commonly peach or apple but sometimes cherry, plum or witch-hazel. This was held horizontal by the "water-smeller," a hand grasping the end of each fork. The supposition was that when carried over a spot where an adequate supply of water could be found by digging, the butt end would deflect sharply downward without any conscious action by the holder. The water witch was said to "work" with some people but not with others. To the realist it would appear that the supposedly occult power of the witch was most likely to be expressed in the hands of a man whose judgment as to where water was likely to be found had been matured by experience. The water witch has followers to this day.

Other superstitions of the time were equally deep and devious. If a cock crowed at 10 P. M. it would rain before morning. If the ground hog came out of its burrow on February second and the sun shined enough at any time during the day for it to see its shadow, six weeks more of winter would follow. Seed corn should be passed through a bottomless earthen crock before being planted so as to protect it from devastations by crows and cut worms. Newly purchased pigs should be backed into the pen. To make good vinegar it was necessary to call into the bung-hole of a barrel of cider the names of three old women who had the unenviable reputation of being the most sour-tempered females in the neighborhood; then drive in the bung and let the acidulous inoculum work.

Witches and demons of all sorts were abroad. Many phases of occult lore continued to play an important part in the life of many Pennsylvania farmers until after the middle of the nineteenth century. Then farmers became less at the mercy of the fates and more in partnership with the immutable forces of nature.

AMERICAN PHILOSOPHICAL SOCIETY

In colonial days there was little inducement for associative effort among farmers. Agriculture was largely self-sufficient; this did not create a desire to band together for the acquisition of knowledge that would enable farmers better to meet the problems of their vocation. Initiative in this respect came mainly, not from those who depended upon the soil for a livelihood, but from well-to-do patrons of agriculture who maintained country seats.

For more than half a century "gentlemen farmers" were the most potent force for the improvement of Pennsylvania agriculture. They were the connecting link between agricultural research, then just beginning to develop, and the working farmer. It was natural that this should be so. Until long after the Revolution agriculture was the occupation of more than ninety per cent of the population, hence it was a matter of concern to men in all walks of life. Not until after 1840 did manufactures and commerce begin to vie with agrciulture in importance.

The first sustained effort in America to promote the application of the natural sciences to agriculture was begun in the Philadelphia area by the American Philosophical Society, which was established to stimulate research in all fields of learning. By 1760 Newtonian science, with its conception of a world governed by physical laws which could be discovered by research, had begun to find acceptance on both sides of the Atlantic. Scientific discoveries, such as the Leyden jar, better understanding of electrical phenomena, Priestley's work on the constituents of air, and the development by Linnaeus of the natural system of classifying plants, aroused intense interest among a few leaders in America.

Benjamin Franklin, with his customary initiative, crystallized this interest. In 1727 he founded the Junto, for the discussion not only of politics but also of what was then called "natural philosophy." In 1744 he was the moving spirit in organizing the Society for the Promotion of Useful Knowledge, membership in which was to consist of "ingenious men, resident in the several colonies." John Bartram, the farmer-botanist, David Rittenhouse, the astronomer, and six other distinguished Philadelphians were charter members. This society had an agricultural as well as a pure science objective. In launching it Franklin specified, "That the subjects of the correspondence be: all new-discovered plants, herbs, trees, roots, their virtues, uses etc.; methods of propagating them and making them useful . . . new mechanical inventions for saving labour . . . as for drainage of meadows." Possibly his friend John Bartram inspired Franklin to write this statement. In 1749 Franklin reported his epochal experiments on electricity which led to the development of the lightning rod.

After an auspicious beginning the Society languished; the time was not yet ripe. In 1769 it was revived under the name of The American Philosophical Society. Within twenty-five years this numbered in its membership outstanding men in all the colonies, including George Washington and Thomas Jefferson. The Society is still active; it is the oldest learned society in America.

The objective of the American Philosophical Society was not only to stimulate research in the pure sciences—as chemistry, physics, botany and astronomy—but also in applied science, particularly agriculture. Of the six standing committees provided in the Laws and Regulations of 1769, one was on "Husbandry and American Improvements." Premiums were offered to stimulate the development of improved methods of farming. In 1796 a premium of $60 was provided "For the best method, verified by experiment, of preventing premature decay of peach trees." A committee was appointed to recommend methods of restoring the fertility of wornout soils. The minutes from 1769 to 1809 contain more than 120 items relating to agriculture. The most outstanding essay on agriculture in the Transactions was that by Dr. Francis Alison on "Hints for Improving the Present State of Our Agriculture," read on April 2, 1773.[5]

The American Philosophical Society was the parent of the Philadelphia Society for Promoting Agriculture, founded in 1785, and of the Philadelphia Academy of Natural Science, founded in 1812. It made some significant contributions to the advancement of agriculture. It is doubtful, however, if the influence of its publications and discussions was felt beyond the small circle of gentlemen who comprised its membership.

PHILADELPHIA SOCIETY FOR PROMOTING AGRICULTURE

The success of the Revolution released pent-up energies in the new republic. In pride of achievement, the patriots immediately began to seek means of making their nation more prosperous. First to receive attention was its major industry, agriculture. Washington, Jefferson, Franklin and other leaders were aware of the marked progress of Great Britain in agriculture resulting from the work of Jethro Tull, Charles Townshend, Robert Bakewell, Sir John Sinclair, Arthur Young and others. This was in striking contrast with the stagnation of agriculture in America. They sought means of stimulating more efficient farming here.

The method adopted was that which had been found serviceable in Great Britain—the organization of agricultural societies. The first such society was the Edinburgh Society of Improvers in the Knowledge of Agriculture in Scotland, organized in 1723. A similar society was founded in Dublin in 1731; and in 1754 the Society for the Encouragement of Arts, Manufactures and Commerce was established in London, with improvement of agriculture as its primary objective. By 1785 a considerable number of national and district agricultural societies flourished in Great Britain and on the continent.

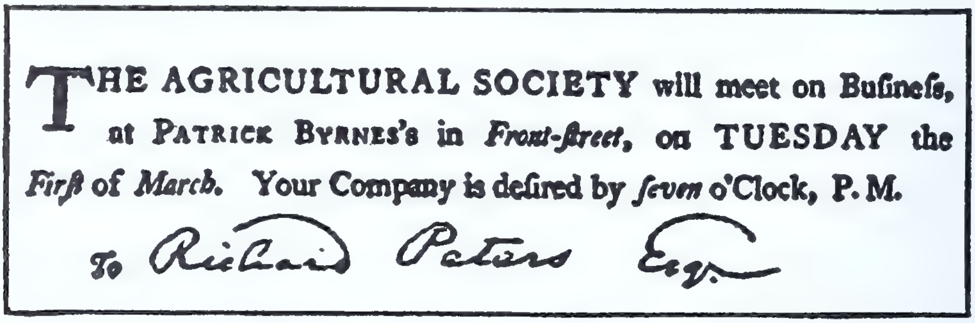
The first agricultural societies to be organized in America—The New York Society for the Promotion of Agriculture, Commerce and Art (1781), the New Jersey Society for Promoting Agriculture, Commerce and Arts (1781) and The South Carolina Society for Promoting and Improving Agriculture (1784)—had but a brief existence. The first agricultural society that survived, and still serves in honorable distinction, was the Philadelphia Society for Promoting Agriculture, organized in 1785. A number of similar societies were founded elsewhere before 1800, including the New York Agricultural Society in 1791 and the

Massachusetts Agricultural Society in 1792. All were patterned after those of Britain; they were not intended to include working farmers but only wealthy patrons of agriculture who could use their country estates to test new methods developed at home or abroad. It was the belief of the founders that "The interests of Commerce, Arts and Manufactures form, with Agriculture, an indissoluble union to which citizens of every class and calling have it amply in their power to contribute."

The idea of an agricultural society in Philadelphia had germinated, many years before, in the fertile brain of Benjamin Franklin; it came to fruition through the American Philosophical Society, which he founded. In 1775 the author of *American Husbandry,* repeating a suggestion of Franklin, inquired, "Why cannot the gentlemen of Philadelphia and its neighborhood who are lovers of agriculture form themselves into a society for the encouragement of that noble art? . . . They might, in monthly meetings, be able to settle upon a plan of operations which would in a few years, by means of an annual subscription given in bounties and premiums, alter the face of things." [6] Then came the Revolution; nothing could be done to put the suggestion into effect until the close of hostilities.

On February 11, 1785, twenty-three gentlemen met at Patrick Byrne's Tavern, Sign of the Cock, on Front Street between Walnut and Spruce. To all of them agriculture was not a business but an absorbing avocation. They were members of the "learned professions"—lawyers, doctors, ministers, educators—also merchants and men prominent in political life; not one was a working farmer. Their interest in agriculture was genuine, but it was quite different from that of a man who must make a living from the land.

The moving spirit of the enterprise was John Beale Bordley, who owned a large farm on Wye Island, Chesapeake Bay. He had been a member of the Committee on Husbandry and Rural Affairs of the American Philosophical Society. Samuel Powel, twice mayor of Philadelphia, was elected President. Four of the twenty-three charter members—George Clymer, Robert Morris, Benjamin Rush, and James Wilson—were signers of the Declaration of Independence and two were members



THE AGRICULTURAL SOCIETY will meet on Buſineſs, at PATRICK BYRNES's in *Front-ſtreet,* on TUESDAY the *Firſt* of *March.* Your Company is deſired by *ſeven* o'Clock, P.M.

To Richard Peters Esq.

Meeting notice of the Philadelphia Society for Promoting Agriculture, 1806.

of the Federal Constitutional Convention. Among other prominent charter members were Richard Peters, George Logan and Humphrey Marshall. The name of the real progenitor of the Society, Benjamin Franklin, was soon added to the membership roster. By 1789 the Society had honorary members in each of the thirteen states, including George Washington and Thomas Jefferson. Such was the caliber of the men who organized the first permanent and, as measured by its influence in early days, greatest agricultural society in America. They were a small group—rarely were there more than fifteen or twenty at a meeting—but they made history.

At a meeting on January 2, 1786, the Society adopted as its motto a line from an old English poem, "Venerate the plough." This appeared on the official seal and on medals awarded. The sole objective of the Society was "to promote a greater increase in the products of the land." This was to be attained by offering premiums for new and meritorious methods of farming and superior crops and livestock, holding exhibitions, printing memoirs and fostering the organization of other agricultural societies.

At a meeting on April 15, 1785, premiums were offered "For the best experiment made of a course of crops . . . a piece of silver plate valued at $200."; and "For the best method of recovering worn-out fields," gold and silver medals. These premiums were typical of those offered throughout the early years; they were designed to stimulate the discovery of new and better methods of farming and the solution of problems of production, rather than merely to reward the producer of "the biggest pumpkin" or the "fattest ox." They stimulated experimentation in agriculture at a time when rule of thumb farming prevailed. The epochal experiments of John Beale Bordley and George Logan on crop rotations and soil fertility grew out of the activities of this Society. So also did the discovery by Richard Peters of the value of gypsum as a soil amendment. Members of the Society were foremost in the introduction of superior breeds of livestock from Europe. These and other contributions revolutionized Pennsylvania agriculture.

Exhibitions were an important feature of the program. Early meetings in Carpenter's Hall displayed from time to time superior farm products and new farm implements. For several years the General Assembly authorized the County of Philadelphia to pay to the Society $600 a year to be used for premiums at its cattle shows and other exhibitions, at which no admission was charged.

During its early years the proceedings of the Society were published in current periodicals. A few papers were printed in pamphlet form; the most widely circulated of these was Richard Peters' "Agricultural Inquiries on Plaister of Paris," published in 1797. From 1808 to 1825, during the administration of Judge Peters, Memoirs 1 to 5 were published; these, together with Memoirs 6 (1937) are the most valuable repositories of information on early Pennsylvania agriculture. After 1825 the Society, unfortunately, returned to its former policy of using current periodicals as a medium of publication.

The Society was very instrumental in promoting the establishment of other agencies for agricultural education and research. At a meeting on January 28, 1794, it adopted a committee report which recommended that the General Assembly be petitioned to establish "a state society for the promotion of agriculture"; and that county societies, affiliated with the state society, be organized.[7] This forward-looking program failed to command majority support in the Legislature. Said Richard Peters, "We were finally defeated by some country members . . . who turned, in a committee, the scale of votes against us. They insisted that the best mode of improving agriculture was to 'lay your hands on the plough-handles and urge on your horses'." [8] But seed was sown that bore fruit later.

In spite of this set-back the Society continued to press toward its educational objective. George Washington added the weight of his great influence. Through his correspondence with Sir John Sinclair and Arthur Young he kept in touch with agricultural progress in England. On September 10, 1796, Sinclair wrote to Washington, "I hope you will recommend some Agricultural Establishment on a great scale before you quit the reins of government. By that I mean a Board of Agriculture or some similar institution in the capital, with Societies of Agriculture in the capital of each state to correspond to it." On December 5, 1796, Washington recommended to Congress that a National Board of Agriculture be established. Congress failed to approve the recommendation. In 1816 Elkanah Watson of Massachusetts presented another plan for such a Board; this met a similar fate. In 1821, the Philadelphia Society again memorialized the General Assembly and the Committee on Agriculture of the House recommended that a State Agricultural Society be established, but no action was taken.[9] Not until 1851 was this authorized by the legislature.

In January 1819 the Society memorialized the General Assembly to authorize the organization of "an Agricultural Society in each county of the state and to appropriate a certain sum of money to be distributed in premiums." [10] This became a law on March 6, 1820. Many counties availed themselves of the provisions of the Act. In 1822 the Society was prominent in a movement to establish a State Board of Agriculture. [11] This proposal did not reach fulfilment until 1856.

The Society was instrumental in establishing the School of Veterinary Medicine of the University of Pennsylvania, the first such School in the nation. In 1806 it offered a premium "for the best essay and plan for promoting veterinary knowledge and instruction," the essay to be "calculated to rouse the attention of medical professors to this important branch of neglected knowledge." [12] This resulted in an address by Dr. Benjamin Rush on November 2, 1807, on "The Duty and Advantages of Studying the Diseases of Farm Animals and the Remedies Proper to Remove Them."[13] The School of Veterinary Medicine, established in 1883, was a belated result of this meeting. The Society was the most active proponent of the "Agricultural School Convention," held on March 9, 1853, at Harrisburg which led to the foundation of the Farmers' High School, later The Pennsylvania State College, in 1855.

In 1805 the Society built the first large covered bridge in America and the first substantial bridge into Philadelphia, the "Permanent Bridge" across the Schuylkill at Market Street. This was primarily an agricultural enterprise—to facilitate the movement of farm produce into the city. Richard Peters was the moving spirit. It was built without bonds, mortgages, preferred stock or governmental aid; investors were repaid by tolls.

By 1789 the Society had 133 resident and 146 non-resident members. The latter were men of distinction in all walks of life in all the thirteen states and abroad. After 1795 it "fell into a long sleep," from which it was awakened in the winter of 1804. In 1805 Samuel Powel, the first President, was succeeded by Richard Peters who presided until 1828. During the twenty-three years of his administration the Society reached the zenith of its influence; thereafter it continued to serve agriculture with distinction but shared authority with other state agencies, most of which were the result of its own initiative.

Any appraisal of the forces which have shaped Pennsylvania agriculture must give preeminence to the Philadelphia Society for Promoting Agriculture. It was the fountainhead of progress for many years. At a time when most working farmers were singularly indifferent to any procedure not validated by tradition, this little group of gentlemen farmers tried new methods and conducted experiments out of which came a number of epoch-making improvements. In time, these springs of living water seeped down to the grass roots of every-day farming. An even more important contribution was the initiative of the Society in promoting the organization of other agencies for agricultural education and research, most of which are serving Pennsylvania farmers today.

At a cattle show in 1822 the Philadelphia Society for Promoting Agriculture developed discord over the award of premiums. A small group of dissatisfied members seceded and organized the Pennsylvania Agricultural Society. There were other alleged reasons for dissatisfaction, particularly the desire of the dissident group to admit working farmers to membership. The moving spirit in the enterprise was John Hare Powel, adopted son of the first President of the parent organization. The General Assembly was induced to direct that funds heretofore paid by Philadelphia County to the older society for premiums at exhibitions be transferred to the new organization.[14] Said Powel, "Our Association is principally composed of practical farmers—by act of incorporation all others are excluded from office." This stipulation, however, was observed only in a Pickwickian sense for the Society was dominated by gentlemen farmers; Powel, who was one of them, was Corresponding Secretary and the chief promoter. Organization was effected on October 19, 1822, at Buck Tavern on the Lancaster Turnpike.[15] Jonathan Roberts, United States senator from Pennsylvania, was elected President. By 1824 the Society had about 150 members.

The major activity was exhibitions or cattle shows, mainly of imported livestock, which then was the center of agricultural interest. This was natural, since Powel was an importer and breeder, especially of "Improved Durham Shorthorns." The first exhibition was in October 1823 at Paoli. It comprised "more than an hundred neat cattle, an hundred and fifty sheep, thirty horses, sixty swine and many of the implements of husbandry." There were several "contested trials of horses and oxen at the plough."[16] The second exhibition was held at Chester on October 14 and 15, 1824.

The preponderence of livestock at these exhibitions is evidenced by the premiums agreed upon for the show of 1825: "Resolved, that at the next exhibition $410 be offered in premiums for neat cattle, $149 for sheep, $210 for horses, $100 for oxen at the plough, $60 for ploughmen with horses and oxen, $28 for swine, $135 for crops, $10 for sheep shearing, $20 for butter and cheese, $10 for sugar (maple), $10 for pearl ashes, $10 for domestic wool, $10 for cider, $35 for implements of husbandry, $163 for domestic manufactures."[17]

The Society published two Memoirs, for 1823 and 1824. These, together with "Hints for American Husbandmen," were mostly from the facile pen of John Hare Powel. After his persuasive influence was withdrawn in 1826, the Society fell apart.

Other early agricultural organizations, aside from county societies, included the Society for the Promotion of Agriculture, Manufacturing and Commerce, organized in Philadelphia in 1787, and the Pennsylvania Society for Improving the Breed of Cattle, commonly called the Cattle Society, organized in 1809. The first had a brief and undistinguished existence; the latter held cattle shows from 1809 to 1814 and was influential in developing interest in superior livestock.

County Agricultural Societies

Most working farmers were indifferent to, if not scornful of, those more opulent so-called "scientific farmers" as represented in the membership of agricultural societies; "they talk politics and publish non-sence," said one horny-handed son of the soil. The immediate influence of their publications on working farmers was negligible; most farmers viewed the written word with distrust and were skeptical of "book farming." This distrust was due, in part, to the patronizing attitude of many wealthy owners of country estates toward those they called "our hardy yeomandry," who were freemen, not peasants, and who resented being told how to farm by men who had never held a plow. Their farming was governed by custom and precedent, not experiment. To experiment, they thought, was to theorize and, in their opinion, theory was opposed to practice. Only demonstration—seeing with their own eyes—could convince them of the worth of a new practice or a new implement.

This was provided, in part, by county agricultural societies. Such societies had been successful in Great Britain for a quarter of a century. There were a few county societies in Pennsylvania prior to 1815. One was organized at Lancaster in 1787 and was revived briefly in 1800, when premiums were offered for flax. The Blockley and Merion Society for Promoting Agriculture and Rural Economy was active about 1791. [18] In 1810 county societies were functioning in Bucks and Luzerne counties. [19]

The Bucks County Society for the Promotion of Agriculture and Domestic Manufacturers held its first meeting on December 11, 1809 and held exhibitions until 1812. These exhibitions, however, were more like the market fairs of medieval Europe than educational exhibitions. The announcement of the exhibition of 1812 reads, "A considerable number of several kinds of livestock will be offered at public and private sale—viz: Horses, Working Oxen, and Store Cattle; also a few Yearlings of the celebrated Bakewell breed and a number of Sheep, consisting of full and mixed blood Merino rams, of highly improved Leicesters and also of common breeds." [20]

The hey-day of county agricultural societies occurred during the years 1815 to 1825. In 1807 Elkanah Watson, a retired business man of Pittsfield, Massachusetts, exhibited two imported Merino sheep in the public square of that town. In 1810 he persuaded twenty-five of his neighbors to join him in an exhibition of improved livestock. The Berkshire County Fair—the first in America—was chartered by the Legislature of Massachusetts in 1811. The annual show developed into the Berkshire County Agricultural Society, with a program of addresses, parade, "agricultural ball" and other diversions in addition to the exhibition. This became the model for similar organizations throughout the northeastern states.

The "Berkshire type" of agricultural society quickly captured the interest of working farmers of Pennsylvania who had remained aloof from the older societies. They considered its program "practical." This was the first agency for agricultural education that had a popular appeal. After 1815 the movement spread rapidly; it was accelerated by the action of the General Assembly on March 6, 1820, authorizing the organization of such societies and making appropriations to them. In his message to the Legislature in 1819 Governor Findlay recommended that such organizations be encouraged by paying to them money for premiums out of the state treasury. The Legislature, however, placed this obligation on the counties.

The Act provided that when twenty or more persons in any county, fifteen of whom must be actual farmers, should sign an agreement to pay one dollar each annually for this purpose to the County Treasurer, the County Commissioners were required to levy taxes which would provide the Society with $50 annually for each county representative in the General Assembly. This appropriation, together with the annual subscriptions of members, was to be expended by the Society at its discretion, but mainly to pay for premiums. Under the Act, county agricultural societies had a very broad educational objective. They could pay premiums not only for superior farm products but also for "the introduction of any new grain, grass or root into cultivation; the raising of the greatest quantity of grain, grass or roots on any given quantity of ground; the invention of any new and useful utensil in husbandry . . . the introduction of mineral and other manures, the improvement of breeds of horses, cattle, sheep or hogs . . . to purchase books relating to agriculture, to purchase or improve land for the purpose of a pattern farm." [21] In practice, however, the money was used only for premiums.

The response of farmers to this invitation was enthusiastic. The Bucks County Agricultural Society was organized in 1819; Chester organized in 1820 and Susquehanna, Franklin and Allegheny before 1822. By 1825 about fifteen such societies were functioning. The Luzerne County Agricultural Society, however, continued to offer modest premiums without state aid. Its premium list for 1824 included: [22] "For the best field of wheat, less than 30 acres, $5; of corn, $5; of oats, $3; best acre of potatoes, $3; best half acre of flax, $4; best cow, $5; best bull, $5; best ram, $3; best home-made plow, $5."

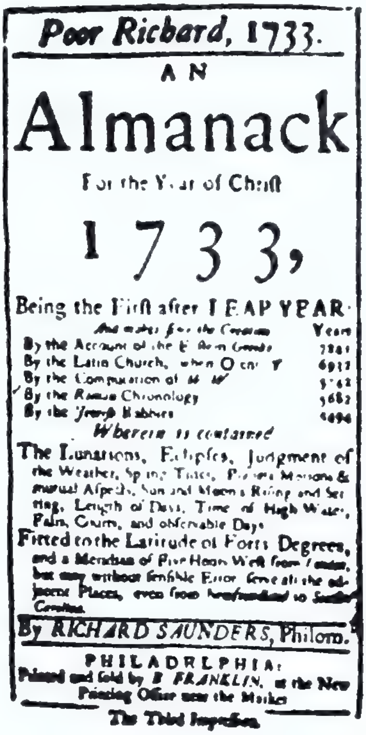
The high tide of Berkshire type county agricultural societies was reached in 1825, at which time state aid was withdrawn; thereafter most of them disbanded. They had failed to meet the unjustified expectations of some farmers that they might solve the serious economic problems of agriculture at that time. Many farmers, also, were chagrined because most of the premiums were awarded without regard to cost of production or practicality, especially to monstrous beef animals exhibited by gentlemen farmers which were wholly impractical in commercial farming. However, the competitive exhibits did much to awaken interest in superior livestock, better cultural methods and improved machinery. Plowing matches held in connection with the exhibitions helped to develop more efficient locally-made plows. The addresses, or "literary program," were likely to be more literary than practical, but here and there good seed found lodgment in fertile soil.

In some cases the social features of county agricultural societies were valued more than their educational programs. Witness this account of a meeting of the Bucks County Agricultural Society: "In 1828 the Society met at the house of Joseph Archambault . . . The Pomona brandy manufactured by Michael H. Jenks was placed on the table, free and plenty, and appears to have acted like a charm. The brandy and the maker were warmly toasted. When the age of the brandy was given it was toasted again, and the more it was tasted the older and better it became . . . It was remarked afterward that several of the members knew more about good brandy than they did about good ploughing." [23]

ALMANACS

Prior to 1840 few farmers gleaned information on agriculture from the printed page. Many were illiterate. Most of those who could read and write were content with the simple exposition of wisdom found in almanacs. The Bible and the almanac were their sole sources of authority, the one on spiritual the other on temporal matters. Books, memoirs of agricultural societies and periodicals were perused only by gentlemen farmers; "book farming" was considered by most tillers of the soil to be theoretical and hence impractical.

Between 1700 and 1840 the old faithful almanac was undoubtedly the most important means of disseminating information on agriculture. It occupied a place of honor second only to the Scriptures and the hymn book in most farm homes, especially among Germans. The annual editions were stitched together and hung on a nail by the fireplace; sometimes they were preserved in unbroken sequence for fifty years. The almanac occupied the place now filled by the newspaper, radio and



Poor Richard, 1733.
AN
Almanack
For the Year of Chriſt
1733,
Being the Firſt after LEAP YEAR
Wherein is contained
The Lunations, Eclipſes, Judgment of the Weather, Spring Tides, Planets Motions & mutual Aſpects, Sun and Moon's Riſing and Setting, Length of Days, Time of High Water, Fairs, Courts, and obſervable Days
Fitted to the Latitude of Forty Degrees, and a Meridian of Five Hours Weſt from *London*, but may without ſenſible Error, ſerve all the adjacent Places, even from *Newfoundland* to *South-Carolina*.
By *RICHARD SAUNDERS*, Philom.
PHILADELPHIA:
Printed and ſold by *B. FRANKLIN*, at the New Printing Office near the Market
The Third Impreſſion.

Facsimile title page of Franklin's Poor Richard Almanac for 1733.

farm journal combined. To destroy or mutilate an almanac was an act of vandalism of which no well-brought up farm child would be guilty.

The almanac was the diary and account book of the farmer; on the margins or on blank pages were written all manner of notes and comments. Here are a few of the notes on a Conrad's Agricultural Almanac for 1825: "First Month, 5th., Bought boar Pig of John Pascal, 4 weeks old, @ 1 dollar. Fourth Month, 12 th., Finish sowing oats. Hired Josiah Webster for one month at 9 dollars. Sixth Month, 27th. Cradled wheat, 32 bushels on one acre and one half. Eighth Month, 8th. Cart rim came off."

The earliest almanac published in America was originally issued by one William Price at Cambridge, Massachusetts, in 1639. The first published in Pennsylvania was *Kalendarium Pennsilvaniense* by William Bradford of Philadelphia, in 1686. Comparatively few almanacs were distributed, however, until after 1732 when Benjamin Franklin began to publish his *Poor Richard's Almanac*. This was the most famous of all such publications. As related by Franklin, "In 1732 I first published my Almanack, under the name of Richard Saunders; it was continued by me about twenty-five years [1732-1757] and was commonly called *Poor Richard's Almanac*. I endeavored to make it both entertaining and useful and accordingly it came to be in such demand that I reap'd considerable profit from it, vending near ten thousand. . . . It was generally read, scarce any neighborhood in the province being without it." [24]

Poor Richard's Almanac was the most widely quoted publication in America, next to the Bible. Its homely proverbs and common sense were influential in moulding American character. Not all of the maxims were original with Franklin; he gleaned industriously from the Scriptures and from ancient and contemporary authors. The gem of his personal contributions, and the one most widely quoted, was the preface to the issue of 1758. Each number contained twelve to sixteen pages and sold for five pence.

The following samples of Poor Richard's sayings indicate his pithy wisdom:

> The worst wheel of the cart makes the most noise.
> If you know how to spend less than what you get, you have the philosopher's stone that turns into gold.
> He that by the Plough would thrive
> Himself must either hold or drive.
> A little house well fill'd
> A little field well till'd
> A little wife well will'd
> Are great riches.
> The sleeping fox catches no poultry.
> Beware of little expenses; a small leak will sink a big ship.
> Plough deep, while sluggards sleep
> And you shall have Corn to sell and keep.
> Keep your eyes wide open before marriage, half shut afterward.

Poor Richard's Almanac was succeeded by *Poor Richard Improved* (1757-1773), which gave much attention to agriculture under such items as "For a foundered horse" and "Easy methods of Increasing the milk of cows." Many of these were bits of experience contributed by subscribers.

Practically all German farm homes had copies of *Der Hoch-Deutsch Americanische Calendar,* printed at Germantown by Christopher Sauer. This first appeared in 1738 and was published by the Sauers for forty years, after which it was continued by others. German farmers had implicit faith, not only in its superstitions, astrology and bits of information, but also in its long-range weather prognostications. A Montgomery County farmer who desired to drive to Philadelphia consulted his almanac and found that the day would be fair. By the time he reached Germantown, however, he was drenched. When he reproached Christopher Sauer the author blandly replied, "Friend do not be thus angry, for although I made the almanac, the Lord Almighty made the weather."

Almanac weather predictions were, of necessity, couched in guarded not to say indefinite terms. Such statements as, "It may gather up for a storm today," or "It looks like rain but there probably will be none," were common. One almanac, with pungent humor, states, "This year the sun will repeatedly rise before many people leave their beds and set before they have done a day's work."

Among other almanacs that circulated in Pennsylvania were:

Der Deutsche Pilgrim, Philadelphia, 1731-1733.

Der Gantz Neue Verbesserte Nord-Americanische Calendar, Lancaster, 1776-1787.

Poor Will's Almanac, Philadelphia, 1786-1794.

Scull's Pittsburgh Almanac, Pittsburgh, 1801-1807.

Pittsburgh Magazine Almanac, Pittsburgh 1803-1829. This was the most widely circulated almanac in western Pennsylvania.

Pittsburgh Town and Country Almanac for Rogues and Honest Folks, Pittsburgh, beginning in 1812.

Conrad's Agricultural Almanac, Philadelphia, 1812-1827. This had wide circulation. The title page for issues from 1818 to 1827 states, "Patronized by the Philadelphia Society for Promoting Agriculture." Issues for these years contained numerous extracts from essays and discussions of the Society. This was in accord with the action of the Society in 1816: "Resolved: That the distribution of agricultural information and the proposition of questions calculated to excite observation and inquiry, as well as to induce the farmers of our country to communicate their experience in husbandry through the medium of the Almanack, would be productive of important benefit to society." [25]

Baer's Agricultural Almanac, published at Lancaster by John Baer and his descendants for more than a century, is still a tradition and a going concern among German farmers.

Almanacs continued in daily use on many farms until after 1840. When printing presses became common and farm journals and country newspapers were more widely read, the quality of the material in almanacs began to deteriorate. Advertisements of patent medicines and testimonials from people who had experienced miraculous cures replaced solid information. After 1860 almanacs largely passed from use except as a handbook and notebook. In spite of the superstition and hocus-pocus associated with them, especially in early years, almanacs were the most important medium for disseminating information on agriculture for nearly a century.

PERIODICALS

Periodicals were a negligible factor in agricultural education until after 1819, when the *American Farmer* was founded. Prior to then a few magazines and newspapers occasionally carried articles of interest to farmers. Those most commonly read in Pennsylvania were:

Columbian Magazine, Philadelphia, 1786-1792. Articles on agriculture by John Beale Bordley and Benjamin Rush appeared in this publication.

American Museum, or Universal Magazine, Philadelphia, 1787-1792.

American Register, or General Repository of History, Politics and Science, Philadelphia, 1806-1812.

Archives of Useful Knowledge, Philadelphia, 1811-1814.

Niles' Weekly Register, Philadelphia, 1811-1849.

Register of Pennsylvania, Philadelphia, 1828-1835.

Observer and Record of Agriculture, Science and Art, Philadelphia, 1839-1842.

Weekly and daily newspapers occasionally carried brief items on agriculture or were organs of agricultural societies. The more important of these were:

American Weekly Mercury, Philadelphia, 1719-1750. This was the first newspaper in the United States.

Pennsylvania Gazette, Philadelphia, 1728-1845. This was begun as *The Universal Instructor in all Arts and Sciences;* it was taken over by Franklin, as the *Gazette,* in 1729. It had a considerable rural circulation.

Pennsylvania Packet, or General Advertiser, later the *American Daily Advertiser,* Philadelphia, 1771-1791. In 1784 it became the first daily newspaper in the United States.

After 1820 some weekly rural newspapers had departments or columns on agriculture; usually these were related to the activities of county agricultural societies. Among the best of these were the *Pittsburgh Gazette* (when that metropolis was but a village), *Harrisburg Chronicle, Butler Repository, Erie Gazette* and *Franklin Repository.*

Between 1819 and 1840 a number of important new farm journals appeared. The one most commonly found on Pennsylvania farms was *American Farmer,* Baltimore, weekly, 1819-1834. This was the first and most influential of early agricultural periodicals. It was the first real organ of American farmers; the short lived *Agricultural Museum* of Washington, D. C., 1810-1812, can hardly be considered as such. Others, with more limited circulation in Pennsylvania, included:

Plough Boy, Albany, New York, weekly, 1819-1823.

New England Farmer, Boston, Massachusetts, weekly, 1822-1846. This was the second most influential of early farm journals; it had a considerable circulation in Pennsylvania.

Farmers' Register, Richmond, Virginia, weekly, 1833-1842.

Genesee Farmer, Rochester, New York, weekly, 1831-1839. This was merged with *Country Gentleman* in 1853.

Cultivator, Albany, New York, weekly and monthly, 1834-1866 when it was merged with *Country Gentleman.* This was one of the best agricultural journals of its time.

Farmers' Cabinet, Philadelphia, monthly, 1836-1848 when it was merged with *American Agriculturist.* This was the first strictly agricultural journal published in Pennsylvania and the only one during the twelve years of its existence. It was the organ of the Philadelphia Society for Promoting Agriculture.

During the period from 1819 to 1840 farm journals reflected the interests and activities of gentleman farmers more than those of working farmers. This was natural since most of their subscriptions came from this source. They were inclined to be pedantic, prosy and much given to theorizing and the publication of half-baked "experiments." This strengthened the suspicion of working farmers that "scientific farming" was impractical. Said one disgusted son of the soil, "Farm papers contain so little that is of use to the small, poor farmer and so much about great farms owned by the rich; all of which is beyond the reach and calculated to discourage the great mass of farmers." Another protested, "It seems to me that every philosopher, lawyer, doctor, merchant and gentleman of leisure, when he has nothing else to employ him, sits down and amuses himself by writing for the agricultural papers." This was one reason why it was estimated, in 1831, that "not one farmer in fifty regularly subscribes to a farm journal."[26] Not until long after 1840 did farm journals reflect the interests of working farmers.

BOOKS

Farmers of the colonial period by and large seldom read books except the Bible. There were few books on agriculture. Said Humphrey Marshall in 1786, "It is not many years since Virgil and Columella, old as they are, remained almost the only writers on agriculture worth consulting." What books there were available were mainly by English authors; they were full of platitudinous quotations from Cato, Pliny, Virgil and Columella. America did not cut herself loose from the mother country agriculturally until long after political ties had been severed.

Of seventy-one additions to the library of the Philadelphia Society for Promoting Agriculture between 1811 and 1814 only seven were American. Some English books were reprinted here, perhaps with annotations and adaptations; such were William Forsyth's *Treatise on the Culture and Management of Fruit Trees,* and Charles Varlo's *A New System of Husbandry.* Books were expensive; few farmers could afford them, even if they could digest the ponderous tomes.

The first book on agriculture written by an American was *The Husbandman's Guide,* by John Allen, printed in Boston in 1710. This was of local interest only. The first great American book on agriculture was *Essays on Field Husbandry in New England,* by Jared Eliot, printed in Boston in 1760. This gathered into one volume six essays previously published separately, the first in 1748 the last in 1759. It was a landmark in American agriculture. Many copies of the essays, separately and collectively, were sold in Pennsylvania. Benjamin Franklin, John Bartram, John Beale Bordley and George Logan, all of whom were correspondents of Eliot, were appreciative readers. On July 25, 1754, Logan wrote Eliot, "I have had the opportunity of reading thy several Essays on Husbandry . . . and think the Farmers of Your Country are greatly obliged to thee."[27] Eliot's *Essays,* particularly the parts relating to soil fertility, had a profound influence on Pennsylvania agriculture.

In 1775 an anonymous book, *American Husbandry,* was published in London; it was written by "An American". It has been suggested, with considerable supporting evidence, that the author was John Mitchell, an English physician who lived in Virginia for several years; and that it was published anonymously because of the strained relations between Britain and her colonies at that time. Obviously it was written some years before its publication; John Mitchell died in 1768. It has been suggested, also, that Arthur Young, the great English authority, edited the manuscript. *American Husbandry* is one of the most important sources of information on colonial farming; it contains many references to Pennsylvania agriculture. Unfortunately it was unknown, or ignored, until about the twentieth century.

After the Revolutionary War indigenous books on phases of American agriculture appeared more frequently. The first to be published in Pennsylvania was *The Practical Farmer,* by John Spurrier, printed in Philadelphia in 1783. According to Job Roberts, Spurrier was "an old experienced farmer of Brandywine Hundred, New Castle County, Delaware". The book has little merit. Two years later, in 1785, Charles Varlo published in Philadelphia a reprint of his *A New System of Husbandry,* previously published in London. Varlo was an Englishman who lived in Pennsylvania several years. It is a remarkable book in many ways and was widely read, especially by the several hundred "subscribers" in Philadelphia and vicinity. He reported numerous "experiments," which were mostly shrewd tests and observations.

Samuel Deane's *New England Farmer,* published in Worcester, Massachusetts, in 1790, though valuable for that region, found but slight acceptance here. It was overshadowed by four Pennsylvania books which appeared at about the same time; Benjamin Rush's *Essays; Literary, Moral and Philosophical* (Philadelphia, 1798); Tench Coxe's *View of the United States of America* (Philadelphia, 1794); and two books by John Beale Bordley, *Sketches on Rotation of Crops* (Philadelphia, 1792) and *Essays and Notes on Husbandry and Rural Affairs* (Philadelphia, 1799). Bordley's books were widely read and had greater influence in bringing in the "New Agriculture" than any other publications.

Judge Bordley's books had a number of signally unsuccessful imitators. Among these were John Binns's *Treatise on Practical Agriculture* (Fredericktown, Maryland, 1803); James Humphrey's *Gleanings on Husbandry* (Philadelphia, 1803); and Job Roberts' *The Pennsylvania Farmer* (Philadelphia, 1804). The latter was largely a compilation from English and American sources but it reports a number of the author's experiments.

Richard Peters summarized numerous experiments and observations on the use of land plaster in his *Agricultural Inquiries on Plaister of Paris* (Philadelphia, 1810). This book, while serviceable at the time, could not stem the current that was even then setting in toward the use of lime instead of gypsum. His *Notices for a Young Farmer* (Philadelphia, 1818) was an admirable treatise which could be perused even today with profit.

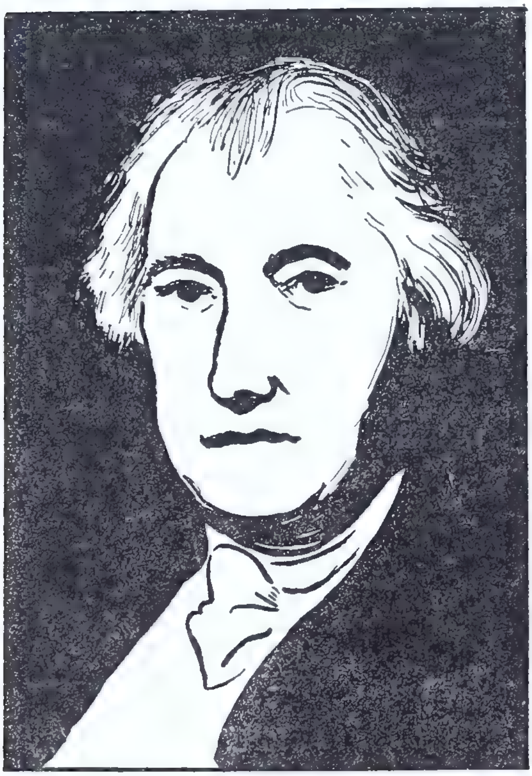
During the first half of the nineteenth century several excellent books on horticulture were published by Philadelphia authors (Chapter 9), but no important books on agriculture appeared after those of Judge Bordley. Four of very meager merit were published in Pennsylvania: *The Arcana of Arts and Sciences; or Farmers' and Mechanics' Manual,* by M. Parker (Washington, 1824); *Nature and Reason Harmonized in the Practice of Husbandry,* by John Lorain (Philadelphia, 1825); *Economy of Agriculture,* by David Lloyd (Germantown, 1832); and *Frank; or, Dialogs Between Father and Son on the Subject of Agriculture,* by James Pedder (Philadelphia, 1840). The latter appeared serially in successive numbers of *Farmers' Cabinet.*

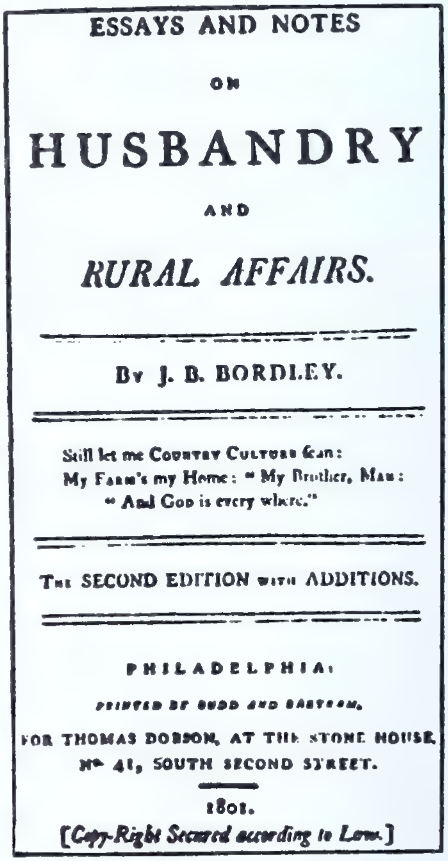
AGRICULTURAL EDUCATION

Writing to his wife concerning the education of their children, William Penn said, "Let it be useful knowledge . . . agriculture especially . . . Let my children be husbandmen and housewives; it is industrious, healthy, honest and of good example." Unfortunately, for both the children and the colony, this wise counsel was not followed.

Of our agricultural education pioneers the first agricultural teacher in Pennsylvania was Dr. Francis Alison, a Presbyterian clergyman and scholar. He established a school for boys at New London, Chester County, in 1743 at which he attempted to teach, in addition to the classics, "natural philosophy," which then included all the natural sciences as applied to agriculture. The school had a 1,500 acre farm as a laboratory. What degree of success attended the agricultural aspect of the school program is not known; but it is known that Dr. Alison was an outstanding agricultural leader of his time and prominent in activities of the American Philosophical Society relating to agriculture.

Benjamin Franklin was far in advance of his time in realizing the need for organized agricultural instruction and research. In 1759 he





ESSAYS AND NOTES

ON

HUSBANDRY

AND

RURAL AFFAIRS.

BY J. B. BORDLEY.

Still let me COUNTRY CULTURE ſcan:
My FARM'S my Home: "My Brother, MAN:
"And GOD is every where."

THE SECOND EDITION WITH ADDITIONS.

PHILADELPHIA:
PRINTED BY BUDD AND BARTRAM,
FOR THOMAS DOBSON, AT THE STONE HOUSE,
Nº 41, SOUTH SECOND STREET.

1801.
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John B. Bordley (1727-1804) and a facsimile of the title page to his famous Essays.

addressed the Philadelphia Academy of Science on "Proposals Relating to the Education of Youth in Pennsylvania." He pleaded, "While they are reading Natural History might not a little Gardening, Planting, Grafting, Inoculation be taught and practiced; and now and then Excursions made to neighboring Plantations of the best Farmers, their methods observed and reasoned upon for the Information of Youth, the Improvement of Agriculture being useful to all and skill in it no disparagement to any?" [28]

Some years later, in 1792, the celebrated Philadelphia physician, Dr. Benjamin Rush, also advocated that the prevailing classical instruction of his time be supplemented by vocational instruction. He urged that natural history, mathematics, geography, chemistry and the principles of agriculture be taught in the schools.[29] There was no immediate response to this plea as related to agriculture, but some progress was made in providing instruction in the natural sciences that underlie agriculture. The first professor of botany in the United States was Dr. Adam Kuhn, a student of Linnaeus, who joined the faculty of the College of Philadelphia, later the University of Pennsylvania, in 1768. There is no record of any important contribution by him. In 1789 Dr. Benjamin S. Barton was appointed Professor of Natural History and Botany at that institution. He was one of the most distinguished of early American botanists; his *Elements of Botany,* published in 1804, had wide circulation.

After the Philadelphia Society for Promoting Agriculture was organized, in 1785, it immediately began working heartily to champion the cause of agricultural education and research. In 1784 the General Assembly appropriated £150 to the American Philosophical Society for "the improvement of agriculture"; this was the first state appropriation for the betterment of agriculture other than by subsidies.[30] Little was accomplished with it. In 1785 the Philadelphia Society for Promoting Agriculture gave consideration to the possibility of establishing "agricultural experiment farms, to be conducted by the Society," and requested a member, Col. George Morgan of Princeton, N. J., an authority on agriculture, to submit an estimate of the probable expense, which he did.[31]

At its meeting on January 10, 1786, George Clymer proposed, "That a skillful English farmer, acquainted with the best improved modes of husbandry in England, be sent for and employed on a farm to be rented by the Society in the vicinity of Philadelphia for a term of years, for the purpose of experimenting." [32] The Society approved the plan but was unable to raise the necessary funds.

At a meeting of the Society on January 21, 1794, it is recorded that "Mr. Bordley, Mr. Clymer, Mr. Peters and Mr. Pickering be a committee to prepare outlines of a plan for establishing a state society for the promotion of agriculture . . . connecting it with the education of youth in the knowledge of that most important art while they are acquiring other useful knowledge suitable for the agricultural citizens of the state; and that a petition to the legislature be drawn up with a view to obtaining an act of incorporation."[33] The plan reported by this committee and adopted by the Society at a meeting on January 28, 1794, recommended that the General Assembly "endow professorships to be annexed to the University of Pennsylvania and the College of Carlisle and other seminaries of learning, for the purpose of teaching the chemical, philosophical and elementary parts of the theory of agriculture; or, by adding to the funds of the Society, to increase its ability to propagate a knowledge of the subject and stimulate, by premiums and other incentives, the exertions of agricultural citizens."[34]

The report further recommended that "county schoolmasters be secretaries of the county societies and the schoolhouses be the place of meeting and the repository of their transactions, models, etc. The Legislature may enjoin on the schoolmasters the combination of the subject of agriculture with other parts of education." It was recommended that "Pattern Farms be established in different and convenient parts of the state, to be used for experiments on methods of maintaining soil fertility, tests of new varieties of crops and new types of farm implements, the improvement of farm animals by breeding" and other aspects of agricultural research. The National Farm established by the French government in 1783 was cited as an example of a successful pattern farm.

This was a comprehensive and far-seeing program for the advancement of agriculture, though manifestly impracticable in some respects. The General Assembly, however, failed to approve any of the proposals, mainly because of opposition from rural members. Said Judge Bordley, in bitter summary of the legislative battle, "The application was rejected by the husbandmen who were principally to be benefited."

In 1798 "A Farmer of Mifflin County" proposed that there be established at public expense "seminaries for agricultural knowledge and improvement" at Hartford, Connecticut, Philadelphia and Charleston, South Carolina. Said he, "Each of the seminaries might consist of one experimental and one practical farm, totalling 300 or 400 acres, under different professors. . . . The professor in each seminary of experimental agriculture should be so lodged as to be enabled to accomodate his pupils in board &c., on reasonable terms; which with 200 or 300 dollars tuition and a certain salary might induce a well educated professional farmer (every way qualified) to accept the professorship . . . If the professors of experimental agriculture should be qualified to teach the higher branches of mathematics and to give lectures in Botany their usefulness would be greatly increased. To the farm buildings should be annexed a workshop for making farmers' implements, a repository for models of all implements used in husbandry and a library for the professors and students, with a few acres of land to experiment on (I suppose fifty)." [35] This proposal aroused favorable comment but nothing came of it.

In the opening years of the nineteenth century interest in schools of agriculture was stimulated by the success attending the operation of such schools in Germany and Switzerland, beginning about 1799. Higher education in agriculture in Europe was provided by the establishment of agricultural colleges at Hohenhein, Germany, in 1818, at Pomerania in 1835 and at Cirencester, England, in 1840. Columbia College, New York, now Columbia University, created a professorship in "Natural History, Chemistry and Agriculture" in 1792. This was supported in part by funds provided by the New York Legislature but nothing came of it.

On March 19, 1805, the General Assembly appropriated $3,000 to the University of Pennsylvania to establish a botanic garden, which was placed in charge of Professor William P. Barton. On October 4, 1818, the University trustees established a Faculty of Natural History and created in it three professorships: Botany and Horticulture; Natural History, including zoology, geology and comparative anatomy; and Mineralogy and Chemistry as applied to agriculture and the arts. Little of value resulted; there were few students and institutional support was meager. The Faculty in Natural History was abolished in 1828.

Meanwhile the Philadelphia Society for Promoting Agriculture had not lost sight of its proposal to the Legislature in 1794. "A pattern farm is an object we have long had at heart," said William Tilghman in 1820, "and it is not to be relinquished lightly; but the time has not come for carrying our wishes into effect. At present we have not sufficient funds." Three years before this the Society had petitioned the General Assembly, "praying for an appropriation to enable them to establish a pattern farm where experiments in agriculture may be tried under the superintendence of the Society." [36] The objective was approved by the Legislature but no money was appropriated; most of the rural members were opposed to the plan.

The Society, however, made at least one convert. In his address to the Legislature on December 3, 1818, Governor Findlay said, "Though the art of agriculture may be enlightened and assisted by science, it is not from speculations and theories alone but from various and repeated experiments, together with close observations, that a proper knowledge of it is to be obtained. The expense of making those experiments, frequently uncertain in their results, few individuals have the ability or inclination to encounter. It might, therefore, be advantageous if the Commonwealth were to purchase within her limits several small farms embracing various qualities of soil and place them under boards of managers, or voluntary societies formed for the purpose, with directions respectively to make experiments of the effects of the native manures, of the different modes of tillage, of the cultivation of grains and grasses, of breeding domestic animals, of rearing fruit trees, of the utility of newly invented implements of husbandry intended to facilitate or abridge labor . . . and periodically to publish the results." [37] The Governor's proposal met a cool reception; working farmers were opposed to it.

Prior to 1840 most of the active interest in agricultural instruction in Pennsylvania was restricted to vocational training patterned after that of the Fellenberg School in Switzerland. In 1807 an Agricultural Institute was established at Hoffwyle, near Berne, by Rev. Emanuel de Fellenberg. His purpose was to provide practical instruction in agriculture to youth, on a farm, through a program of combined class-room instruction and practice.

At a meeting of the Philadelphia Society for Promoting Agriculture on September 18, 1827, it endorsed a proposal of Anthony Morris of Philadelphia that he found a school on his "Bolton Farm," near Bristol, Bucks County, for "classical, scientific and agricultural instruction." Said Morris, "Our prejudices lead us to associate all ideas of schools and scholars with houses and desks, while the field itself, the scene of the farmer's operations, is seldom suggested as the best school for his practical instruction." [38] Students were to be required to work on the farm under close supervision at least half of each day. It was hoped that eventually returns from the sale of crops and livestock would make the school largely or wholly self-supporting.

On April 30, 1830, Morris announced in a circular that he proposed to establish a "Classical, English and Agricultural Institute," with the following terms: age of students not to exceed twelve years at entrance; charge for English branches, $210 a year, this to include board and clothing; charge for agricultural branches $10 a quarter. Rev. William Chadderton was appointed Headmaster.[39] There is no record that this school was actually in operation; if so, it soon closed.

Several other Fellenberg-type schools were projected but not realized. Robert H. Rose, an urbane land salesman and promoter of Silver Lake, Susquehanna County, had "an inclination to establish an Agricultural College . . . an essential part of which is that a farm attached to it shall furnish all the clothing and food of the scholars and professors and thus present the best essay on practical and scientific Agriculture which could be exhibited to the students, who would be expected to take a part for a couple of hours in the morning and as much in the cooler hours of the afternoon in the operation of the farm." [40] Probably this is the enterprise referred to in the Act of Assembly on April 23, 1829, "For the establishment of a classical and agricultural School in Susquehanna County." [41] The proposed school never materialized.

On March 7, 1827, the General Assembly passed "An Act for the Establishment of a College at Uniontown, Fayette County, to be called Madison College. . . . The Trustees of said College shall have power to establish a department of Agriculture in said College."[42] So widespread was interest in the Fellenberg type of vocational school that in 1831 the Senate adopted this Resolution: "That the Committee on Education be instructed to inquire into the expediency of making provision, by law, for the establishment of a competent number of academies or schools in which agriculture and mechanical employment shall be combined with literary and scientific instruction."[43]

In 1837 the Assembly received a petition from citizens of Union County praying for legislation in aid of agriculture. The committee to which this was referred reported, "Agriculture must in some way be interwoven with our system of education"; and suggested that "an agricultural school and pattern farm" be established "which would, under proper regulations, imbue the minds of its pupils with valuable principles and exemplify and illustrate those principles with a corresponding and successful practice."[44] Nothing was done.

Our first agricultural school, "Mount Airy Agricultural College," near Germantown, was projected about 1846. Students were to be admitted at ten years or older. Said the announcement, "Each little boy will have his Budding and Pruning Knife, his miniature Rake and Hoe and in fine weather will daily repair to the Gardens and Nursery . . . As he advances in years and strength he will be introduced to the more weighty concerns of agriculture . . . The exercise of labour by all, however, will amount to no more than will be deemed necessary for healthful recreation . . . The graduates of the College will be Scholars and Gentlemen . . . Terms, $200 per annum. James Gowen, Headmaster."[45] This "college" operated in a desultory way for several years; apparently there was not enough demand for "scholars and gentlemen" to justify its existence.

All these projects were premature; working farmers were not yet ready to support formal agricultural instruction, being convinced that only education secured in the school of experience, under parental training or under the apprentice system, is practical. State-supported agricultural schools and pattern farms continued to be discussed in farm journals and at meetings of agricultural societies; but not until 1855, when the Farmers' High School at State College was founded, did they become a reality.

AGRICULTURAL RESEARCH

Practically all formally organized efforts for the much needed improvement of agriculture prior to 1840 were directed to education; there was little conception of the function of scientific research save by a few leaders. In 1743 the program of the American Philosophical Society, as proposed by Benjamin Franklin, included, "To promote investigations on the draining of meadows, nature of the soils, new methods of improving the breeds of useful animals . . . new improvements in planting, gardening and clearing land; and all philosophical experiments that let light into the nature of things and tend to increase the power of man over matter."[46] Forty years later Franklin expressed the conviction that scientific research "would diminish the Labour of Agriculture and double the Produce."

Considerable progress was made in the eighteenth century in the study of the natural sciences, but few applications of these discoveries to agriculture developed until the nineteenth century. Lavoisier (1743-1794) laid the foundation of chemistry and Linnaeus (1707-1778) of systematic botany. In 1803 Sir Humphrey Davy (1778-1839) began research that led to the publication of *Elements of Agricultural Chemistry,* and in 1813 Bousingault (1802-1887) used his farm as an experiment station. In 1840 Liebig (1803-1873) published *Chemistry in its Application to Agriculture and Physiology;* and in 1842 *Animal Physiology.* His work, together with the epochal experiments on soil fertility at Rothamsted, England, by Lawes and Gilbert, begun in 1837, created widespread interest in America and led, ultimately, to the establishment of agricultural experiment stations.

Several leaders in early American agricultural research were residents of Pennsylvania. In 1735 James Logan, Secretary of the Province under William Penn, published at Leyden and in 1747 at London, *Experimenta et Meleternata de Plantarum Generatione.* This reported results of experiments on sex in corn.[47] He concluded, "It is very plain that the Farina emitted from the Summits of the Styles [tassels] is the true Male seed and absolutely necessary to render the Uterus and Grain fertile." In 1752 Benjamin Franklin showed that the thunder and lightning of summer storms and the aurora of winter are manifestations of the same mysterious force, electricity; and he invented the lightning rod. John Bartram was first in the New World to describe plants according to the Linnaean system and to hybridize plants. The experiments of John Beale Bordley and William Logan on crop rotations and the maintenance of soil fertility laid the foundation for much of present practice. The experiments of Richard Peters on the use of gypsum ushered in a new era of more profitable farming.

Agricultural research is costly and time-consuming; only men of means and leisure can undertake it privately. Necessarily, progress was slow until public support was available. This did not come until long after 1840. Until then the farmer was guided mainly by tradition and experience, not by science. Most of the so-called "experiments" made during this period were empirical tests, not carefully controlled research.

AGRICULTURAL LEADERS

The outstanding agricultural leaders of Pennsylvania prior to 1840 were Benjamin Franklin, John Beale Bordley and Richard Peters.

The contribution of Benjamin Franklin (1706-1790) to agriculture was as a statesman, scientist and man of affairs rather than as a farmer. He owned a farm of 200 acres near Kembleville, Chester County, but there is no record that he ever operated it personally. He did not own a farm in New Jersey, as was for a long time supposed.[48] Franklin was the moving spirit in founding the Society for the Promotion of Useful Knowledge, later the American Philosophical Society, the first organization to give attention to agriculture.

In 1749 Franklin initiated the movement that led to the organization of the Academy of Science in Philadelphia and suggested for it a program of agricultural education and research which ultimately was carried out. His recommendations for the curriculum of the Academy of Philadelphia, later the University of Pennsylvania, emphasized the importance of combining practice with theory in instruction. Franklin's scientific writings included 63 papers on electricity and 157 on philosophical subjects. As representative of the colonies in Europe he introduced into America many new plants, mainly through his close friend, John Bartram. For twenty-five years Franklin's *Poor Richard's Almanac* was the most influential publication of its kind. We are indebted to Benjamin Franklin, more than to any other man, for the initiation of movements that led, ultimately, to the organization of state agencies for agricultural education and research.

John Beale Bordley (1727-1804) was the most influential man in Pennsylvania agriculture during the last quarter of the eighteenth century. Agriculture was his absorbing interest, not his means of livelihood. He was a lawyer; for many years he served as Judge of the Admiralty at Annapolis, Maryland. About 1770 he moved to a 1,400 acre farm on Wye Island, Chesapeake Bay. Under his skillful management it became one of the most successful farms in America. He also operated a 360 acre farm in Chester County.

Judge Bordley had an inquiring mind; he conducted numerous experiments on his farms, particularly on crop rotations and the maintenance of soil fertility. He was the moving spirit in the organization of the Philadelphia Society for Promoting Agriculture in 1785; thereafter he lived in Philadelphia part of each year and identified himself closely with the activities of the Society. His *Sketches on Rotations of Crops* (1792) and *Essays and Notes on Husbandry and Rural Affairs* (1799) were the most significant agricultural books of his time and a potent factor in bringing in the "New Agriculture."

Richard Peters (1744-1828) was a Philadelphia lawyer and an ardent patron of agriculture. His magnificent country seat, "Belmont," now is a part of Fairmount Park. He was President of The Philadelphia Society for Promoting Agriculture for twenty-three years, from 1805 to 1828, the period of its greatest service.

The most outstanding contribution of Judge Peters was the introduction of gypsum for use as a soil amendment; this quickly resulted in the more general use of lime, red clover, grass, livestock and in better farming. He took the initiative in activities of the Philadelphia Society which resulted, ultimately, in the organization of several other state agencies for agricultural education and research. While not a working farmer, Judge Peters was an authority on practical agriculture; his *Notices for a Young Farmer* (1818) found wide acceptance. The Memoirs of the Society contain more than a hundred papers by Judge Peters. He made several notable contributions to horticulture, particularly on the cause and control of peach yellows. The chain of events in the history of progress in Pennsylvania agriculture inevitably leads back to the Philadelphia Society for Promoting Agriculture and to its most influential President—Richard Peters.

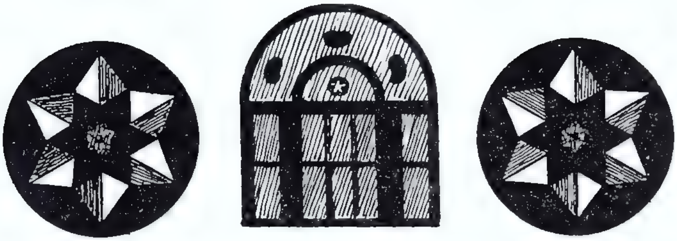
James Logan (1674-1751), first Secretary of the Province and Acting Governor for two years, contributed to agricultural advance with his experiments on sex in corn, conducted at "Stenton," his country seat near Germantown, which were far in advance of his time. His grandson, George Logan (1753-1821), who succeeded to the ownership of Stenton, also devoted himself to agricultural experimentation; he shared with Judge Bordley the distinction of being the chief promoter of modern methods of crop rotations and maintenance of soil fertility.

John Bartram (1699-1777), successful farmer and self-taught pioneer American botanist, not only introduced many new ornamental plants but also was one of the most progressive farmers of his day. He was a potent factor in shaping the agricultural activities of the American Philosophical Society.

Francis Alison, a Presbyterian minister and educator, was closely associated with the agricultural program of the American Philosophical Society. His address before that Society in 1773, "Hints for the Improvement of Agriculture," was the most significant contribution in this field before the organization of the Philadelphia Society for Promoting Agriculture. In 1753 he was appointed Vice-Provost of the College of Philadelphia, later the University of Pennsylvania.

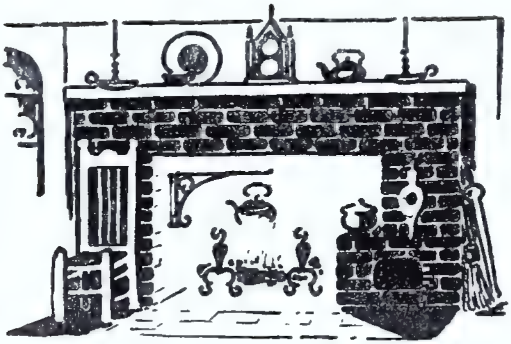
To this brief list should be added those who made Philadelphia the center of interest in horticulture in America for more than a century: Humphrey Marshall (1722-1801), William Coxe (1762-1831), David Landreth (1752-1880), Bernard M'Mahon (1775-1816), and William Darlington (1782-1863).

None of the six men who had the greatest influence in shaping early Pennsylvania agriculture was a working farmer except John Bartram who, however, was more absorbed in botany than in agriculture during his latter years. They were professional men who found agriculture an engrossing avocation. Not until after 1840 did working farmers take control of farm organizations and exercise leadership in the advancement of their vocation.



Traditional Pennsylvania barn designs.

XV



THE FARM HOME

A HOME reflects the character as well as the means of those who live in it. This is particularly true of rural homes. Each of the nationalities that entered most largely into the settlement of Pennsylvania brought differing traditions in homemaking. For nearly two centuries these were perpetuated in the New World; prior to 1840 there was much justification for the common differentiation—"English Pennsylvania," "Scotch-Irish Pennsylvania," and "German Pennsylvania" in homemaking as well as in other respects. Thereafter these distinctions gradually disappeared.

THE FARMHOUSE

By far the most important considerations in locating the pioneer home were quality of soil, transportation facilities and access to a spring or other water supply. Even after roads had been laid out, farm buildings were located primarily with reference to economy in hauling crops to the barn and convenient access to water, hence they might be some distance from the road. In 1799 John C. Ogden observed, "As the German husbandmen seek the conveniences of meadows and water before they erect their houses and then build in the most commodious place where these can be obtained, the houses do not appear so frequently on the roadside as in the northern states." [1]

Few Pennsylvania farm homes had wells with picturesque sweeps which characterize the New England colonies. Usually water for family use was carried from a spring or stream in buckets. The water supply might be several hundred feet from the cabin and usually down hill. Several trips to the spring were necessary every day; usually this arduous task was considered "woman's work." Sometimes the cabin was built directly over a spring in order to ensure a water supply in the event of

Indian attack. This provided a cool cellar for keeping milk, butter, cheese and other produce.

Some of the first settlers were indeed literally cave-dwellers. Cavities were excavated in the banks of the Delaware, well above high water mark and large enough to make huts about twelve by fifteen feet. The side walls were supported with sod or interlaced saplings. The roof was made of limbs covered with sod, rushes or bark. The floor was packed earth. The chimney was made of cobblestones or pieces of wood held together by clay and grass mortar. Often the side toward the river was left open; if closed, entrance was by a very narrow door. A strip of greased paper admitted a gleam of light into the dark interior. These rude cave-huts sheltered the families of many immigrants until more substantial log cabins could be built.

Pastorius, who arrived at Philadelphia in 1683, lived in a cave for some time; the experience did not daunt his staunch spirit. "The caves," he says, "were only holes digged in the Ground, Covered with Earth, a matter of 5 or 6 feet deep, 10 or 12 wide and about 20 long; whereof neither the Sides nor the Floors have been plank'd. Herein we lived more Contentedly than many nowadays in their painted & wainscotted Palaces . . . I myself purchased one for 5 £ . . . in the midst of Front street at Philadelphia." [2]

Inland pioneers often lived temporarily in a hunter's shelter or half-faced camp until cabins could be built. This was made of interwoven brush and saplings. It had a sharply sloping roof and one side was open toward the fire.

The first home of most pioneers, who settled in Pennsylvania, was a log cabin. This type of dwelling was unknown to the Indians, who built their fragile wigwams, the location of which was changed frequently, of poles, brush and bark, never of logs. It is probable that Swedish and Finnish settlers along the Delaware were first to build log cabins in America.[3] They had been used in the Scandinavian countries and in Germany for many centuries. English and Scotch-Irish settlers had not known log cabins in their homeland but adopted them as the most practicable type of habitation in Penn's Woodland. Log cabins were quickly and easily constructed; the only tools needed were an axe and a saw. No metal was required, not even nails.

Swedes were handy with an axe. In 1683 Thomas Paschall observed, "As for the Swedes, they use but little Iron in Building, for they will build and hardly use any other toole than an Ax; they will cut down a Tree and cut him up when down, sooner than two men could saw him, and rend him into planks or what they please; only with an Ax and Wooden wedge. . . . A Swede will fell twelve of the biggest oaks in one day." [4]

The first log cabins of Swedes, on which the cabins of English, Scotch-Irish and German settlers were patterned, were described by Peter Kalm: "The whole house consisted of one little room the door of which was so low that one was obliged to stoop in order to get in. As they had brought no glass with them they were obliged to be content with little holes, before which a movable board was fastened. They found no moss, or at least none which could have been serviceable in stopping up holes or cracks in the walls. They were therefore forced to close them using clay both inside and out. The chimneys were masoned in a corner, either of gray stone or (in places where there was no stone) of mere clay." [5]

In 1679 two travelers from Holland described the cabins of Swedes and Finns on the Delaware: "They usually build their houses here, which are block-houses, being nothing else than entire trees split through the middle or squared out of the rough and placed in the form of a square upon each other as high as they wish to have the house; the ends of these timbers are let into each other. . . . The whole structure is thus made without a nail or spike. . . . The houses are quite tight and warm. The chimney is placed in one corner." [6]

Some early cabins had no chimney; fire was laid on the earth floor and the smoke escaped through a hole in the roof. In most cabins, however, the chimney was an outstanding feature. Sometimes it was built on the outside and occupied most of one gable end. Often it was made of heavy logs instead of stones, and plastered on the inside with several inches of clay. Nearly all pioneer chimneys smoked badly; not until after the Revolution did an American, "Count Rumford," discover that by making a throat smaller than the flue a draft could be created.

The roof of a Swedish cabin was covered with overlapping clapboards which were split out of clear-grained timber and held in place by weight poles running the length of the roof. The loft was reached by stairs on the outside or inside, or by wooden pegs driven between the logs. Crevices between logs were chinked with moss or wedges of wood and daubed with clay. The floor was pounded earth.

The door was on one gable end. Two or three small openings between logs, covered with oiled paper, admitted a modicum of light to the gloomy interior. A wooden latch dropped into a slot on the inside. To it was attached a leather latch-string by which it could be raised from the outside. When the latchstring was drawn inside, the door was closed to unwelcome visitors; when it was out, all might enter.

When they came to Pennsylvania, English, German and Scotch-Irish settlers enlarged and improved the log cabins of their Swedish neighbors. In advertising pamphlets designed to attract settlers to his province William Penn gave directions for building them. They should be, he said, "thirty foot long and eighteen foot broad . . . with a partition neer the middle and an other to divide one end of the House into two small Rooms . . . with a loft over all. . . . The lower floor is the Ground. . . . This may seem a mean way of Building but 'tis sufficient and safest for ordinary beginners." [7]

The cabins of pioneer German farmers of Lancaster, York, Berks and adjacent counties were essentially like those of the Swedes but larger and floored with puncheons, or split logs. These were smoothed somewhat with the axe and eventually were worn smooth by use. The roof was of small logs or poles thatched with strips of bark, straw, boughs or more fully protected with split boards or "shakes" riven from blocks of pine or hemlock. These clap-boards were held to the roof with "weight timbers," which rattled in every wind and rain, and snow sifted down between them. The door was hung on wooden hinges and sometimes was made in two sections; the lower half of this "Dutch door" might be closed to exclude ubiquitous chickens, pigs and dogs and the upper half left open to admit light and air. The small openings covered with oiled paper that served as windows were protected with heavy wooden shutters.

Unless the door was open, perpetual twilight reigned in the pioneer cabin. During the winter and on cloudy days objects within were scarcely visible without firelight, torches or candles. A little light entered from apertures cut between logs or through a single long window about two feet wide. In winter this was covered with greased paper; in summer it offered the hospitality of the cabin to swarms of flies and mosquitoes. It had a heavy wooden shutter for protection against Indians.

The first shelter of some farm families was a "puncheon and bark cabin". The walls were made of small logs placed upright and touching each other in a trench two feet deep. They were held in place by filling the trench with earth and by pinning a small split log, horizontally, to the middle of each upright. The crevices were chinked with moss or clay. The roof was composed of overlapping squares of chestnut bark and the floor was packed soil. Such a cabin could be "rolled up" very quickly.

Recalling his boyhood days in what is now Jefferson County, W. J. McKnight describes a representative frontier habitation: "The home of the pioneer was a log cabin, one story high, chinked and daubed, having a fireplace at one end with a chimney built of sticks and mud . . . These cabins were usually small but some were perhaps twenty by thirty feet, with a hole cut between two logs for a single window, oiled paper being used for glass . . . They had puncheon floors and a clapboard roof held down by weight poles . . . Puncheon boards or planks were made from a log of straight grain and clear of knots which was split into parts and the face of each smoothed with a broadaxe. The split parts had to be all started at the same time with wedges at the end of the log, each wedge being struck alternately with a maul until all parts were separated."[8]

One-room cabins were not necessarily a sign of poverty. In 1803 F. A. Michaux stayed over night with a farmer in what is now Allegheny County. He commented, "One would think that this man, who has a mill and other valuables, might live in the greatest comfort; yet he resides in a miserable log house about twenty feet long. Four large beds, two of which are very low and are placed underneath the others in the day time and drawn out in the evening [trundle beds], receive the whole family, composed of ten persons, and at times strangers who occasionally entreat to have a bed. This mode of living, which would announce poverty in Europe, is by no means the sign of it here."[9]

As farmers prospered, log cabins were replaced by more pretentious log houses. These were commonly a story and a half high, sometimes two stories. This improvement might be possible within ten or fifteen years after the farmer first laid axe to the virgin forest. The logs were square hewn; the mortar between them was whitewashed. Glass replaced oiled paper in the windows. These were mostly half sash with four or six small panes. The floor was of sawed boards, the chimney of stone and mortar, the roof of nailed-on shingles. There was an inside stairway to the second floor or loft. The interior might be plastered. The beginnings of home decoration appeared—whitewashed walls, window draperies, a few pictures, geraniums blooming in the window. Usually the old log cabin was connected with the new log house by a roofed passage-way and was used as a kitchen. Sometimes it became a detached barn.

Log houses of various types and conditions were the most common type of farm home in central and western Pennsylvania until after 1840. In 1832 Thomas B. McElwee of Bedford County wrote, "Our houses are made of heavy logs, on an average 24 feet long by 20 feet wide, covered sometimes with shingles, sometimes with clapboards. The advantage of the latter kind of roof is that it requires no laths or rafters and no nails and is put on in much less time—it is a poor man's makeshift.

"In the raising frolic the most experienced axe-men are placed on the building as corner men to cut the notches which bind the logs together; the rest of the company are on the ground to carry the logs and run them up on skids. In this way a building is raised and covered in a day, without a mason and without a pound of iron. The doors and windows are afterward cut out as the owner pleases . . . There are very few buildings in the country, except on the turnpike, of any materials other than logs."[10]

Traveling from Reading to Lebanon in 1829 John F. Watson noted, "Almost all their houses [German] are of squared logs, neatly framed, two stories high. . . . The taste is to whitewash the smooth mortar between the logs but not the logs themselves . . . The barns are large and well filled, generally constructed of squared logs or stone; but all the barn roofs are of thatched straw—said to last fifteen years. Their houses are shingled with lapped shingles." [11]

An early historian of the Wyoming Valley describes the farm homes of settlers from New England: "After 1800, log houses were still built in the Wyoming Valley but generally of a much better kind. Frequently they were built on sloping ground with a basement of stone and a one and a half story hewed log building on top, with a porch over the basement. The logs were nicely fitted at the corners and well chinked with stones and plastered with yellow clay. . . . The chimneys of the more prosperous farm homes were from six to eight feet thick at the ground floor and from ten to twelve feet wide, with an enormous hearth and fireplace. They were generally placed near the middle of the house and had a room on each side and a fireplace in each room; some of them had three rooms and a fireplace on three sides. On the kitchen side a large stone oven was frequently built in. Chimneys were all built of stone and laid up with yellow clay for mortar as there was no lime in the Wyoming Valley until after 1830." [12]

More adequate homes began to appear soon. About 1700 a few brick and stone houses were built in Philadelphia: "They begin to build the houses with Stone & many with Brick, whc may be made in any place here," wrote Rowland Ellis of Bryn Mawr in 1698. [13] Few of these, however, were farmhouses.

Eventually the log houses of prosperous farmers were replaced by substantial frame, stone or brick dwellings. This advance commonly occurred during the tenure of the second or third generation on the land. Henry B. Plumb says, "Probably no log houses were built [in the Wyoming Valley] after 1830. When the bottom logs rotted away and the house began to settle a new frame house was built. After 1830 many old log houses in good condition were weather-boarded or sided so that they looked on the outside like a frame house." By that date machine-sawed framing lumber and boards were more commonly available and nails were used instead of wooden pegs.

Raising the heavy joists of the frame was beyond the power of the farmer and his sons; this required the assistance of his neighbors at a "raisin". Only a small amount of hardware was needed, most of which, such as hinges and bolts, was made by the local blacksmith. Wrought iron nails were hammered out by the farmer himself from nail rods purchased at the country store. After 1830 the farm home was expected to include a "parlor," which was strictly reserved for company, weddings and other special occasions.

Prosperous Pennsylvania Germans were among the first to build stone or brick farmhouses. They usually did so only after they had provided spacious and almost equally comfortable quarters for their livestock. "It is pretty," said Lewis Evans in 1753, "to behold our back Settlements, where the barns are large as palaces, while the owners live in log hutts; a sign, though, of thrifty Farmers." In 1789 Benjamin Rush, speaking of the same group, said, "They always provide large and suitable accommodations for their horses and cattle before they lay out much money in building a home for themselves. The first dwelling house upon their farms is small and built of logs. It generally lasts the lifetime of the first settler . . . They have a saying, 'A son should always begin his improvements where his father left off'; that is, by building a large and convenient stone house." [14]

The neat, carefully made farmhouses, the unbroken continuity of German farmers on land that was cleared by their forefathers, and the contribution to the farm home by each generation, was observed by William Cobbett, an Englishman, in 1818: "It is a curious thing to observe the farm houses of this country [Lancaster County]. They consist, almost without exception, of a considerably large and very neat house with sash windows and of a small house which seems to have been tacked on to the larger one . . . The father or grandfather, while he was toiling for his children, lived in the small house constructed chiefly by himself and consisting of rude materials. The means accumulated in the small house enable a son to rear the large one; and though, when pride enters the door, the small house is sometimes demolished, few sons have the folly or want of feeling to commit such acts of filial ingratitude. For what inheritance so valuable and so honourable can a son enjoy as the proofs of his father's industry and virtue?" [15]

German farmers began to build their spacious stone or brick houses long before the Revolution. In 1778 Thomas Anbury journeyed through Lancaster County and noted, "Some of the farm houses are built of stone, two stories high and covered with cedar shingles . . . The farmers of Pennsylvania pay more attention to the construction of their barns than their dwelling houses. Their barns are nearly as large as a country church." [16] The houses were built of limestone, sandstone or brick. Often the stones of the front wall were smooth dressed; the other walls were left rough. Windows and window panes were small. There was no porch or veranda; these were added many years later. Early brick or stone houses were heated by fireplaces set in great chimneys commonly built in the center of the house but sometimes at each gable end. Usually there was an unheated central hall with heated rooms on each side.

German farmers put heart as well as hands into the building of their homes. As related by Franklin Ellis, "After having provided himself with a Swisser barn the Lancaster County farmer set about the erection of a suitable house to take the place of the first log cabin. The preparation for this took several years. Stones had to be quarried, lumber sawed and allowed to season, so that the second generation assisted in the erection and oftentimes were married, and some of them moved into the new mansion along with the parents.

"These houses were generally built of stone, some of them with dressed cornices two stories high, with pitched roof and with cornices run across the gables and around the first story. A large chimney in the middle, if modeled after the German pattern, and with a chimney at either gable-end if built after the English or Scotch-Irish idea. Many of them were imposing structures, having arched cellars underneath, spacious hallways with easy stairs, open fireplaces in most of the rooms, oak-paneled partitions, and windows hung in weights. . . .

"The builders of these houses greatly honored themselves by giving due honor to their wives, partners and helpmeets in the work. High and conspicuous in the front wall or gable they caused to be placed a stone into which was cut, in lasting letters, their names and the names of their wives, with the date of building."[17] Many of these fine old second generation farm homes still stand, though often disfigured by unsuitable modern alterations and additions.

The more spacious farmhouses built by the farmers of Swiss and Palatinate ancestry often had inscriptions on tablets set in the wall, as had been the custom in the fatherland. Usually these were quotations from the Bible or hymnbook. On Peter Bricker's house in West Cocalico Township, Lancaster County was written:

"Gott gesegne diesen Haus,
Und alle was da geht ein und aus;
Gott gesegne alle sampt
Und dazu das ganze Land."[18]

A spacious stone farmhouse in the valley of the Skippack, Montgomery County, built by Peter Wentz and his wife Rosina in 1758 bears this inscription:

"P.W.R.W.

Jesus Kom in Meine Haus
Wei che Nimmer Mer Her aus;
Kom mit Deiner Guaden Gud und stelle
Mein Seel zu Freed."

("Jesus come into my house
And from it nevermore depart;
Come and with Thy grace and peace
Set my soul at ease.")

One of the most common house inscriptions was "Wer Gott vertrant hat wohle, gebant im Himmel und auf erden" (Who trusts in God has builded well in Heaven and on earth).[19] In the building of their spacious stone and brick mansions German farmers seem to have done all, like Cato, "with a view to posterity and the glory of God."

Many of the stone and brick houses built by English and Scotch-Irish farmers also bore inscriptions. John Bartram, the Quaker farmer-botanist, set a stone tablet in the wall of his home at Kingsessing, near Philadelphia, bearing this legend:[20]

"'Tis God, alone, Almighty Lord
The Holy One by me adored.
John Bartram, 1770"

The Welsh *Wynnstag* at Philadelphia and the German *Wyck* at Germantown, both dating from about 1690, were forerunners of what is known today as the deservedly famous Pennsylvania colonial farmhouse architecture. The better type of stone and brick farmhouses built between 1740 and 1840 represent what many consider to be the high point in Pennsylvania rural architecture. They had a distinction that few modern farm dwellings achieve. Their beauty lay in simplicity of design, utility and excellent workmanship. They had individuality; for the most part they were designed and built by the farmers themselves with the aid of skilled local craftsmen. There was almost complete lack of embellishments which merely strive for effect. There was no sham; they were what they pretended to be.

After 1840 the simplicity and dignity of colonial farmhouses were vitiated with scroll-saw and turning-lathe patterns, cupola and other elaborate and meaningless excrescences. In vain did Andred Jackson Downing, America's first great landscape architect, protest against this perversion of the colonial type. He contended that a farmhouse should, first of all, look like a farmhouse, not like a city residence; that it should seek to provide "ampleness, solidity, comfort and simple domestic feeling rather than elegance, grace and polished symmetry." He cautioned farmers against the use of "a profusion of gingerbread work and fantastic and unmeaning decoration" and urged the use of enduring materials of construction. Unhappily, this counsel fell mostly on deaf ears. Only in recent years has there been any considered effort to develop a type of farmhouse architecture that exemplifies the principals set forth by Downing, as adapted to modern conditions.

The prodigious effort required to clear tracts of virgin land of forest begat hostility to trees. Most farm homes of the early colonial period had no shade trees in the yard; to pioneer farmers an open space in the forest giving a clear view of the sky was the most attractive setting for a home. They also thought that trees near the house favored the dreaded malarial fever.

Few shade trees were planted around farm homes until after 1780 and these were mostly inferior introduced species such as weeping willow and Lombardy poplar. Hardy native species, such as sugar and red maple, ash, the oaks, sycamore and white pine were not planted freely until after 1820.

The inextinguishable love of flowers that characterizes farm women everywhere was not to be denied expression, even under the trying conditions of pioneer life. Henry B. Plumb recalls the farm homes of the Wyoming Valley about 1790: "In these early times the people, though surrounded with stumps and stones and brush and woods and the general disorder of new clearings, yet had some taste for the beautiful. Every house had a clump of rose bushes in the door-yard or in the garden and a bunch or two of peonies, a clump of lilac bushes, sunflowers and hollyhocks . . . If there were young girls in the family they would have pinks, pansies, marigolds and morning glories and as many other kinds of flowers as they could get." [21] The German *hausfrau* had a passion for flowers; few of their homes, however humble, were without them.

INTERIOR OF THE HOME

Interior arrangements of a log cabin were simple—they had to be, when one room must serve for all purposes. In this room, which rarely was larger than eighteen by twenty-four feet, lived all the family, including a numerous brood of children. It was their kitchen, dining-room, living-room and bed-room; and it was their castle.

The central feature of the pioneer's simple cabin was the fireplace, which occupied almost all of one gable end. It often was ten or twelve feet wide and four feet deep. Back-logs six feet long and two feet thick were dragged to it by a horse or ox with a rope or chain which passed through the cabin doors or windows; or they were "walked in"—upended—by a strong man. Narrow stone seats were built inside the fireplace, one on either side; from this vantage point children could watch sparks fly upward to join the stars.

At night everybody gathered around the fireplace to perform their accustomed evening tasks—spinning, knitting, making ax-helves—or to talk over the events of the day and plan for the morrow. The family was knit together at the hearthstone. Strangers who had sought the hospitality of the home for the night were warmed and cheered at the glowing heart of the fireplace.

At first, kettles and pots were suspended over the fire from green saplings, which charred slowly; later from an iron crane five or six feet long. Attached to the crane were several iron hooks from which hung pots and kettles at varying distances from the blaze. In early days the crane was stationary; the swinging crane did not appear until about 1730. Leaning against the chimney were shovel, tongs and bellows. On the mantel stood candlesticks and an earthenware pitcher of cider. Resting on antlers above the mantel were the rifle, fowling-piece, powder horn and bullet pouch.

Before iron was available, fire was laid on green logs or stones. These were replaced by andirons, sometimes with brass or copper knobs. Young men who came to court the daughter of the home considered it a good sign that the object of their affection would make an industrious wife if the knobs were polished until they shone.

Hanging from the loft beams above the fireplace were long, smooth poles from which were suspended, strung on twine, sliced fruits and vegetables in season. In early autumn the drying poles were filled with peaches and apples; in late autumn, when it was cold enough to butcher, with pendant strings of sausages and other porcine tid-bits; in early winter with seed corn, rings of pumpkin, red peppers and bunches of medicinal herbs. The drying poles were full most of the year.

In one corner of the cabin almost invariably was a corner cupboard that held the culinary treasures of the family, perhaps a few pewter dishes or some brown earthenware. A spinning wheel with a hank of flax stood near the hearth. A home-made wooden table, two or three wooden benches and a rude bed were the only furniture. The economic status of the family was at once evident to a visitor by the number and quality of articles of "best clothes" displayed on wooden pegs driven into the wall. A pioneer housewife who had a mirror was the envy of her neighbors. A few bright-faced geraniums bloomed in the window.

The meager household equipment of most colonial farm homes is evidenced by the inventory of a prosperous farmer of Lancaster County as appraised November 24, 1735:

"A large Family Bible, £2; two feather beds, £6; wearing clothes, £7; sundry pewter, £2, 8 shillings; a box of iron, 4 shillings; sundry ironware, £2; a watering pot, 6 shillings; wooden ware, £1; two iron pot racks, £1; two chests, 15 shillings; spinning wheel, 8 shillings; Total, £23, 1 shilling." [22]

The frame, brick and stone farmhouses that succeeded cabins and log houses were of course generally much more completely equipped. Those of prosperous German farmers, says Franklin Ellis, were "imposing structures having arched cellars underneath spacious hallways, with easy chairs, open fireplaces in most of the rooms." On one side of the long, unheated central hall, which contained a wooden chest, perhaps brought over from Germany, was the living room, *die Wohnstube.* This was furnished with table, benches or chairs, spinning wheel and closets. On the other side of the hall was the "best room," later known as the parlor; this was reserved for visitors and special occasions and was austerely furnished with a desk and benches or chairs. The bedroom in the rear of the best room contained a bed, trundle bed, cradle, chest of drawers and a bench or chairs.

Adjacent to the living room was the kitchen, the most important room in the house. The dining table with benches or chairs was in the kitchen; it was felt that if the kitchen was a suitable place to prepare food it also should be a suitable place to eat food. Shelving or corner cupboards held the culinary utensils but pots and kettles hung around the wall. If of pewter, they were kept burnished.

The second floor was devoted wholly to bedrooms. The cellar and attic were almost as serviceable as the kitchen. The cellar bulged with bins of apples and potatoes, barrels of cider and salt pork, firkins of butter, tubs of hams in brine and hogsheads of corned beef. The attic was a storehouse of smoked hams, bacon, sausage, beef and other satisfying products of a fat land.

All of the furniture of Pennsylvania pioneer farm homes necessarily was mostly home-made. At first many families slept on the floor on blankets, skins or piles of straw or boughs. The first beds were built by setting forked saplings in the earthen floor from which poles extended to crevices in the logs, then laying other poles across these supports and spreading skins or blankets upon them. The first chairs were sections of the trunk of a large tree.

Bedsteads, tables, benches, chairs, closets and other furniture were the product of the farmer's axe, drawing knife and hunting knife. Speaking of Connecticut settlers in the Wyoming Valley, Henry B. Plumb says, "When clearing their land they selected out the particular kinds of wood wanted for different kinds of furniture and laid it away to season. Afterwards, at night and on rainy days, they made furniture for the home. Hickory was used for chairs, splint or rush-bottomed, and for wagon spokes. Cherry was saved for tables, red oak for barrel staves. Nearly everything was made of wood."[23]

The unpainted tables often were hung against the wall so that they could be turned up out of the way when not needed. Since the furniture was made by the farmer himself it had far more individuality than the standardized machine-made furniture of today. After 1754, when the war between England and France resulted in much higher prices for farm products, particularly wheat, some furniture was imported from England, but little of this found its way to farm homes—it cost too much.

At first most table utensils—cups, plates, bowls, trenchers, spoons, knives, were made of wood. Some settlers brought with them from Europe a few heavy, solid tin dishes and iron pots, but most pioneer families had to improvise.

When the population of a community increased so that it was sufficient to justify the existence of a rural village and trading center, furniture for farm homes was made by local carpenters and cabinet makers. Some of the craftsmen produced very superior furniture; their bedsteads, corner cupboards, highboys, lowboys, tables, chairs and chests of drawers are eagerly sought by modern collectors of antiques. The chairs were mostly straight-backed with bent hickory arms and not upholstered. Many chairs made a century or more ago by village craftsmen and banished to the attic in favor of modern furniture are more comfortable and certainly more durable than the average factory-made chairs of today. The tables were of simple design and quite heavy. The bedsteads were ponderous structures with high posts which held a frame on which was stretched mosquito-bar drapes.

After the Revolution mahogany furniture became the mode among the well-to-do. It was made by local craftsmen of lumber imported from the West Indies. Cabinet makers exercised their utmost skill in carving and decorating these massive pieces, which have been preserved for generations as family heirlooms. Commercial manufacture of furniture began about 1812 when the Congress imposed a tariff of thirty per cent on all imported furniture. Soon thereafter the art of veneering was developed and farm homes were furnished with the cheaper and lighter but less substantial products of the factory.

As the purchasing power of rural families increased, more refinements in the farm home became possible. Dirt and puncheon floors were replaced with board floors, which were kept "broom clean." The broom of early colonial days was a hickory sapling about three inches in diameter. The bark was peeled off and the butt split up for about a foot into fine splints. The top then was split likewise and these splints bent over and tied to those at the other end of the stick. Hemlock and birch branches and several kinds of sedges and grasses, notably "broom-straw" *(Andropogon)* also were used. About 1760 the observant Franklin noticed a few seeds clinging to an imported broom. He planted them and raised broom corn, which soon displaced other materials for this purpose.

Before the advent of carpets, the polished hardwood parlor floors of the well-to-do were swept and garnished every morning with white, sifted sand. The sand was smoothed with a hair brush then marked into elaborate designs, in which the housewife took great pride. Few farm women had time for such superfluities.

Prior to 1830 there were no carpets on rural parlors. The only floor coverings were home-made rag rugs. These had a stout yarn warp and a woof made of strips of cast-off clothing. The first carpet in Pennsylvania was laid in Philadelphia in 1791. A few decades thereafter carpets, blossoming with impossible flowers of irridescent hue, were tacked snugly over rural parlor floors, thereby creating a sanitation problem of which the family, happily, was wholly unaware.

The walls of many farmhouses were whitewashed and some were half or wholly wainscoted; none was papered until after 1800. Chromos, the most common concession to art in many farm homes, did not appear until after 1800. Prior to 1840 an oil painting was the only way to preserve a likeness to posterity; this was too costly for most farmers. The daguerreotype process was invented in France by L. J. M. Daguerre about 1839 and was introduced into America soon thereafter; by 1850 daguerreotypes were generally available.

Melodeons were invented by Jeremiah Cathcart in 1836 but were not found in farm homes, even the most prosperous, until about 1850, when they replaced the tuning fork in rural churches and community singing schools. The modern piano was developed about 1760 but was seldom seen in farm homes until after 1850. Some of our rural great-great-grandmothers played the harpsichord but the melodeon was more popular.

For telling time there were few clocks or watches on farms until after 1840. Most farmers had no means of telling the time except by the shadow cast by the sun. On the window sill or on the kitchen floor was a mark which informed the housewife—on a sunny day—when it was noon and time for dinner. Evening church service was announced to be "at early candle-lighting time." Marked candles also were used to measure time; in 1729 an auction sale in Philadelphia was advertised to be "by inches of Candle." The sand glass or hour glass was used somewhat, especially at churches, where it measured the length but not the depth of the sermon.

Early clocks were hand made and had wooden works; they were operated by weights instead of springs. Clocks with brass works came into use about 1840. Tall "grandfather clocks" were first used in England about 1660; only a few were imported into Pennsylvania before 1725, when German and Swiss artisans who had settled in Philadelphia and Germantown began to make them. After 1740 some were made which indicated the phases of the moon as a guide to farm operations, as well as the time.

Hand-made clocks were quite expensive. Machine-made clocks came on the market in quantity about 1820. At first farmers were distrustful of them and only the glib tongue of peddlers placed them in rural homes. Their suspicion was justified; many early, machine-made clocks were unreliable, though cannily labeled, "Warranted—if Well Used." Watches were first used in Europe about 1600 but were costly; a pocket sun-dial could be purchased at a moderate price and gave good service—on sunny days.

In spite of the perils of travel in colonial days persistent and glib itinerant peddlers carried a variety of small articles to remote farm homes. In 1720 Philadelphia merchants, becoming alarmed at the extent of this trade, petitioned the General Assembly to enact a law that peddlers be required to present evidence of good character before being licensed, because "they have greatly imposed upon many people, as well in the quality as in the price of their goods." These same merchants, however, would have had but scant distribution of their goods in rural districts without the persuasive salesmanship of peddlers.

Peddlers were of two types, "trunk peddlers" and "wagon peddlers." Trunk peddlers walked, carrying a canvas pack or a light tin trunk strapped to their backs. This contained many small articles of constant household use, such as needles, pins, thread, scissors; also articles that would minister to the immemorial passion of women to enhance their natural charms, such as cheap jewelry, ribbons, lace and perfume. Wagon peddlers carried a wider assortment. A few specialized in such articles as stockings woven in Philadelphia mills. Peddlers often bartered their wares for articles of household manufacture, farm produce, furs or pelts. The housewife was glad to exchange rags and cast-off clothing for the goods of peddlers, who sold them to paper mills.

After 1830 tin peddlers were the most numerous and most ubiquitous of their tribe. At first they carried only tinware but soon augmented their stock with an amazing assortment of small articles that might appeal to rural folks, especially women—novelties, jewelry, lace, calico, silks, clocks, handmills for grinding coffee, needles, thread, pins, shoe buttons, steel pens, matches, suspenders, ribbons, perfumes and "other articles too numerous to mention." Hanging on the outside of their rickety old wagons were new and shining tin tea-kettles, dippers, pails, cups, pans, plates; these glittered in the sun and their tinny rattle heralded the approach of the wagon from a mile or more down the road.

Many rural people were addicted to the patent medicines carried by the peddler, such cure-alls as "Turlington's Balsam," "Ward's Anodyme Pearls," and "Bateman's Pectoral Drops." The labels on the bottles assured the credulous that they would cure fifty-seven or more kinds of human ailments. All were practically worthless.

The period from 1820 to 1870 was the hey-day of the tin peddler. During the summer he traveled every turnpike and nearly every back-country dirt road, bringing to rural housewives a tempting display of goods. The appeal of his tinware was not only that of novelty and economy but also ease of doing housework. Previously milk pans were heavy earthen vessels, water was carried from the spring in weighty buckets, and all kitchen utensils were cumbersome. Plated tinware was much easier to handle and was unbreakable.

The tin peddler brought to the farm not only his glittering wagon but also his genial personality. At a time when many farm people had but slight contact with the world beyond the hills that encircled their little valley, he was a welcome visitor. He reaped a rich harvest of profit, but his tinware lightened the work of farm women and his trinkets bolstered their morale. After 1870 peddlers gradually disappeared from the rural scene; their wares could be purchased to better advantage at country stores.

HEATING THE HOME

Colonial farm homes had no running water, bath rooms, electric lights or central heating. The absence of these "conveniences" was not considered a deprivation; people were accustomed to living without them.

Making and keeping the fires of home, for warmth as well as for cooking, was a major household interest. Like the flame on an ancient altar, the fireplace fire was kept burning continuously, summer and winter. In very cold weather some one must get up once or twice during the night to replenish it. In mild weather the fire was covered with ashes at night to keep some live coals until morning. If by any mischance the fire went out, it might be necessary to send a boy to the nearest neighbor for live coals, which were hurried home in a covered pan. Fire was carried from one room to another by means of strands of hemp or flax which had been dipped in sulphur. Rolled paper tapers were not used much until after 1840, when newspapers were received more commonly in rural homes.

Nearly every farm family had a fire-making outfit. A metal tinder box was kept filled with lint or other dry tinder. Flint and steel were used to strike a spark which fell upon a piece of scorched linen, tow lint, fine shavings, "punk" or "touchwood." By gentle blowing the spark could be nursed into a flame. Another method was to flash a little powder in the pan of a fowling piece; the spark might set fire to a twist of tow.

The first matches, introduced about 1810, were merely slivers of wood tipped with sulphur; they were supposed to ignite when brought into contact with phosphorus, which was kept in a vial. Friction matches, called "lucifers," were invented in Europe and patented in America in 1836 but were not used much until after 1850.

For a century and a half the large, friendly open fireplace was almost the sole means of warming the home. Wood was plentiful; in winter great backlogs, which lasted several days, were drawn in. The best fireplace wood was hickory, white oak and black oak in the order named. The fireplace not only gave heat but also light enough for ordinary purposes. In very cold weather one might roast on one side and freeze on the other.

In early years the kitchen was the only really comfortable room in the house; bedrooms seldom were warmed. The shock of the first chilling entrance into an ice-cold bed might be mitigated somewhat by warming the sheets or blankets with a warming pan. This was a covered brass pan about a foot in diameter with a long wooden handle. It was filled with live coals and was moved rapidly back and forth to keep it from scorching the sheets or blankets. Ice formed in bedroom pitchers and had to be cracked for morning ablutions. Our adult colonial forebears were inured to these discomforts, but little children suffered.

On long winter evenings the kitchen fireplace was the center of family life. All gathered around it after supper, the mother to spin or knit, the father to whittle out an axe-helve, the children to roast chestnuts. All, old and young, "moistened their clay" with cider. On stormy nights the blazing fireplace was far more cheerful than the stove that succeeded it. The fireplace was a symbol of closely-knit family life; when it passed, something was lost in the solidarity of the rural home.

The first significant departure from the fireplace came with the Franklin stove. This was invented by Benjamin Franklin in 1744, when he published "An Account of the Newly Invented Pennsylvania Fireplaces." It was not a stove but an open front cast iron fireplace which gave forth considerably more heat from the same amount of wood than a built-in fireplace. By 1760 many farm homes in Pennsylvania had a Franklin fireplace. In 1771 Franklin invented a somewhat similar but much improved stove in which either wood or coal could be burned. It could be closed completely and was provided with a damper so that more heat was radiated into the room. A few of these old Franklin stoves, resurrected from attics, are in use today.

The Pennsylvania German farmers were first to use closed stoves. These were made of heavy tin, later of iron. In 1749 Christopher Sauer's newspaper reported, "A rather new kind of iron stove is being cast at Reading Furnace, by which one can heat a big room and also can cook, fry and bake upon the stove within the room, so that no smell thereof will be noticeable in the room."[24] Large iron closed stoves, called "cannon stoves," were made near Lancaster about 1752.

German stoves were made mostly by local craftsmen in various designs. Some had hot-air drums in the stovepipe for heating second-floor bedrooms. In 1790 Benjamin Rush reported, "The German farmers are very economical of their wood. They burn wood only in stoves in which they consume but a fourth or fifth part of what is commonly burnt in ordinary open fireplaces. . . . Their houses are rendered so comfortable at all times by large, closed stoves that twice the business is done by every branch of the family, in knitting, spinning and mending farm utensils than is done in houses where every member of the family crowds near a common fireplace or shivers at a distance from it." [25]

After 1830 cast iron wood-burning stoves became generally available. At first they were used only in public places—schools, churches, barrooms, shops—seldom in homes. Farmers other than Germans were reluctant to use them because they felt that the open fireplace was the soul of family life; that it would be difficult, if not impossible, to bring up a united family around a stove. Eventually they became convinced that the greater convenience and economy of stoves offset their possible disadvantages in other respects.

After 1840 canals and railroads made it possible to transport stoves more cheaply; then the fireplaces in most farm homes were closed and heating stoves and kitchen ranges took their place. The cooking stove was invented by John Conant of Vermont in 1819 but more than two decades passed before it found favor in rural homes. Central heat furnaces were available about 1845 but few were installed in farm homes until after 1875.

Anthracite coal had been discovered and known in the Wyoming Valley since 1762 and in the Lehigh Valley since 1791 but little was used except by blacksmiths until after 1820. It was thought that anthracite would not burn unless an air blast was forced through it. "In 1808 Jesse Fell, a blacksmith of Wilkes-Barre, found that anthracite would burn well if placed on a good wood fire in a grate elevated five to six inches above the hearth in the old wood-burning fireplaces. Within a few years these grates were installed all over the Wyoming Valley and coal began to be used for heating in winter." [26]

The use of coal for heating farm houses in other parts of the state, except where it was readily available, was delayed by the high cost of transportation and the expense of grates and stoves. After 1840 canals and railroads sharply reduced transportation costs and both anthracite and bituminous coal vied with wood as the source of heat in farm homes.

LIGHTING THE HOME

The day-time gloom of pioneer log cabins, relieved only by feeble gleams of light from greased paper windows and from the upper half of the Dutch door, was brightened somewhat at night by light from the blazing fireplace and from pine knots.

The Swedish settlers on the Delaware used "splinter-sticks" or "lighting-sticks." These were made by splitting resinous yellow pine into thin, flat pieces about a yard long. Several of these were stuck into crevices between the cabin logs, sloping downward; the lower end was lighted. They were soon consumed and had to be replaced frequently. The smoke was almost unendurable unless the sticks were placed only where the chimney carried it off. "Rush lights," made by soaking the dried pith of reeds in grease, also were used.

Pine knot torches were the customary light of pioneer cabins throughout the province. In 1812 John Lorain of Philipsburg said, "Yellow pines have, at some time, prevailed throughout this extensive country . . . Their knots are almost exclusively used in place of candles and when properly fixed in the backs or jams of the fireplaces for burning them, and when they are properly split and quartered, they afford a brilliant light through the room, without the least offense from smoke. These knots spring from the heart of the tree and it is not until the rest of the wood has decayed that they come into use. They are found dispersed on the ground in every direction through the forests . . . and are turned up in ploughing." [27]

Grease lamps were smoky and odoriferous but somewhat more efficient as a source of illumination than pine knots. Bear grease and other heavy animal oils, or refuse grease from the kitchen, were burned in a shallow iron lamp called a "betty" which hung from the ceiling. A piece of rag floating in the grease served as a wick. Whale oil (spermaceti) gave a better light but was expensive; it cost about $25 a month for five hours a day of illumination.

The son of a pioneer family in northwestern Pennsylvania tells of the lighting arrangements in his boyhood home: "Up to and even at this date [1841] the usual light at night in these cabins was the old iron lamp, or else a dish containing refuse grease, with a rag in it. It smoked and gave a dismal light, yet women cooked, spun and sewed and men read the few books they had as best they could. The aroma from this refuse grease was simply horrible." [28] Benjamin Franklin experimented with grease lamps and developed an improved type called the "Franklin lamp."

After the early settlers had been established on the land long enough to accumulate some livestock, they used tallow-dip candles. These were made in the kitchen. Six or eight strands of tow or twisted cotton, which served as wicks, were attached to small, smooth "candle-rods," several inches apart. They were dipped into a kettle of hot tallow grease. The rods of dipped wicks then were hung between benches or chairs. After the light coating of tallow on the wicks had cooled and hardened, the process was repeated again and again; the weary housewife had to walk many miles on candle-dipping days. When large enough the candles were carried on the rods to a dry place for further hardening. The winter's supply of candles was made in the autumn.

Candles were made in molds also. "These were 2, 4, 6, 8, 10 or 12 small tin or pewter tubes joined in a frame. As many wicks as there were tubes were doubled over a small, round stick which was placed across the top of the frame. The wicks were passed through the tubes and fastened at the lower end. Melted tallow was then poured into the trough at the top of the frame until all the tubes were filled. The possession of a set of candle molds was evidence of some wealth. . . . One candle was the number usually employed to read or write by." [29] Some families employed an itinerant candle maker who brought his own molds. A good day's work for him was 200 candles.

Deer, bear and moose fat, as well as livestock tallow, was tried out and used. Candles made from the waxy berries of the bayberry bush were used somewhat, especially by the early Swedes. The berries were gathered in late autumn and put into kettles of boiling water. The melted wax was skimmed off, hardened and re-melted. Transparent, greenish bay-berry candles were worth twice as much as tallow-dips because they did not melt as quickly, did not smoke and had a pleasing fragrance.

All kinds of candles were more expensive than pine knots or grease lamps. In 1761 the President of Harvard College calculated that the cost of common candles to students at that institution was about $8.00 a month for a five-hour daily illumination. After 1860 candles gradually were replaced by kerosene oil lamps.

SLEEPING ARRANGEMENTS

The one room of the pioneer log cabin served as livingroom, kitchen and diningroom during the day and as bedroom at night. At first many families slept on the floor. According to Nils Gustafson, the beds of the early Swedes were "skins of various animals, such as bears and wolves." [30] Others slept on heaps of straw or on pine or hemlock boughs. John Reynolds, one of the early settlers of Crawford County, recalls his boyhood experiences about 1790: "More than half the people slept on the floor with their feet to the fire. It was not unusual, when only one bed was had, for the good wife to put it on the floor, her husband in the middle, she on one side of him and the guest on the other. I have myself so slept in a neighbor's cabin. . . . Nor was there lack of modesty where one room was bed-chamber for all. One sex retired while the other disrobed, then the light—if any—was put out and the former returned and disposed themselves for sleep." [31]

With greater prosperity, wooden bedsteads and crude mattresses of varying degrees of comfort came into use. The first crude bedsteads were small logs with one end fastened to the wall of the cabin and the other supported on crotched sticks. A thin board or a lacing of rawhide or rope served as springs; metal bedsprings were not used until after 1840. A trundle bed, for little children, was pushed beneath the large bed in the daytime and pulled out at night.

According to Henry B. Plumb, farmers in the Wyoming Valley about 1820 "had bedsteads of square posts and rails, unpainted, held together by a strong bed-cord. The first mattresses were of straw, then of fine geese feathers, often with soft pillows of down. There were home-made woolen blankets, home-made linen sheets, fancy, home-made coverlets. The beds were enclosed tight with curtains hung from a frame, often fringed, tasseled and embroidered." [32]

The bedding material of pioneer farm homes was mainly skins of wild animals. Since these could not be washed they became the haunt of fleas, lice and other vermin, to the great discomfort of the family and guests. After crops of grain and hemp were harvested bedticks were made and stuffed with straw or corn husks.

Feather beds were much more comfortable but also much more expensive. German farmers were partial to feather beds, to which they had been accustomed in the fatherland. The *hausfrau* gradually accumulated goose, chicken, duck and wild turkey feathers for this purpose. Geese were kept more for feathers than for food. Fine feathers and down were stripped from live birds three or four times a year and steamed and cured for bedding; quills, which were used to make pens were plucked but once.

Germans used feather ticks not only to sleep on but also for cover. "They cover themselves in winter with light feather beds instead of blankets," wrote Benjamin Rush in 1790; "in this contrivance there is both convenience and economy, for the beds are warmer than blankets and are made by themselves." [33] Those who were not accustomed to feather beds, however, often found them uncomfortable. In 1777 Elkanah Watson of Massachusetts traveled through Lancaster County. "At Reamstown," he says, "I was placed between two beds without sheets or pillows. This, as I was told, was a prevailing custom but which, as far as my experience goes, tends little to promote either sleep or comfort."

BATHING AND WASHING

Facilities for personal hygiene in log cabins were necessarily very primitive. Few large kettles for heating water were available and carrying water from the spring or stream was back-breaking work. Some pioneers rarely bathed at all, except face and hands; they were averse to the use of water, externally or internally, ascribing to it many human ills. In summer men and boys went swimming, quite innocent of bathing suits, and more to cool than to cleanse. Swimming was a strictly masculine pastime; it was considered indelicate, if not actually indecent, for women and girls, even though they wore the voluminous skirts of that period.

In summer women, children and sometimes men went barefoot. In 1836 Dr. Leonard Barton, a meticulous New England physician, gave this unflattering description of farm women whom he had met in Mercer County: "Farm women in this country go barefoot. Their feet are from twelve to eighteen inches long and from four to six inches wide; they might be made much smaller by washing. I think, from the size of their ankles, that their legs are put on wrong end upwards."

The early Swedish settlers were a conspicuous exception to the rule of infrequent bathing. Following the ancient custom of their fatherland they built bathhouses. These were log structures, twelve or fourteen feet square, without windows and with a large fireplace. Large stones were heated to a high temperature then plunged into kettles of water, thus creating a cloud of hot vapor. Around the walls were narrow platforms on which the bathers reclined, unclothed. They perspired freely in the steamy heat; perspiration and circulation were further stimulated by lashing themselves with birch switches. After the bathers were sufficiently "steamed up," they achieved violent reaction by rushing out of doors and plunging into a stream or rolling in snow, according to the season.

The bath house often was in the charge of a "bathing woman" who assisted both sexes in their ablutions. According to Amandus Johnson, "Men and women use the bath promiscuously without any concealment of dress or being in the least influenced by an emotion of attachment. . . . In these bath houses the settlers with families and servants would commonly bathe every evening in the summer during harvest time and twice a week in winter. A strange scene would meet the eye of a visitor who might happen to look into such a bath house, when it was filled with bathers, from the new-born child carried there by its mother to the old man of eighty." [84]

In 1748 Nils Gustafson, one of the first Swedish settlers on the Delaware, told Peter Kalm, "Almost all the Swedes had bath houses and they commonly bathed every Saturday." [85] The Saturday night bath became an established rural institution. Eventually a majority of country folk, of all nationalities, bathed regularly once a week by the kitchen fire in water that had been heated in kettles in the fireplace or on the kitchen stove.

Bath tubs of wood or tin came into fairly general use after 1840. A few were built before houses were equipped with running water. What was reputed to be the first bath tub in America was built in 1842 in the home of Adam Thompson of Cincinnati, Ohio. It was seven feet long, four feet wide and was made of mahogany; it weighed 1,750 pounds. There was no plumbing connection. This monstrosity and other built-in tubs became the center of violent controversy. Some physicians asserted that to bathe in bath tubs "invited rheumatic fever, phthisic [tuberculosis] and inflammation of the lungs [pneumonia]." In 1843 the Common Council of Philadelphia considered but did not pass a proposed ordinance designed to prevent bathing in bath tubs between November and March inclusive, as a measure to protect public health. About the same time the city fathers of Boston did pass an ordinance forbidding the use of bath tubs in that center of learning except on medical advice.

By 1850 bath tubs were common in hotels which had plumbing, but were very uncommon in homes for many years thereafter. At first only cold water was piped to them. Windmills came into use after 1825; eventually these made it possible to have running water, and ultimately bath rooms, in farm homes. The out-of-door toilet, however, reigned supreme in rural Pennsylvania until the beginning of the twentieth century.

In the early days of settlement bodies as well as clothes were cleansed with the aid of soft soap made from grease and lye. Grease rendered at the time of butchering and refuse grease from cooking were accumulated, together with wood ashes from the fireplace. In the spring, water was poured on ashes to leach out the lye; this was called "setting the leach." The old housewife's advice to her daughter was "If your lye will bear up an egg or a potato so you can see a piece of it as big as a ninepence it is just strong enough." The grease and lye then were boiled together in a big kettle hung over an out-of-door fire. German housewives traditionally used a sassafras stick to stir it, and always stirred it one way only.

Soft soap was used for the monthly washing. Not until after the Revolution was every Monday washday to any considerable number of farm women. Before soap was available washing might be done in the cold water of a near-by stream. The housewife knelt on the bank, spread the garments on a large rock or board and pounded them with a paddle to cleanse them, as their ancestors had done in Europe for generations.

Soap stones were used considerably, especially by the Swedes. Says Peter Kalm, "Another stone is called *soapstone* by many of the Swedes, being as smooth as soap outside. They make use of it for rubbing spots out of their clothes. Some of the loose stone is scraped off like powder and strewed upon the greasy spot, on silk or any other material. This absorbs the grease, and after rubbing off the powder the spot disappears."[36]

HOUSEHOLD PESTS

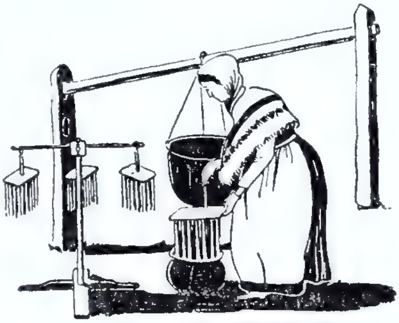
Since the windows and doors of pioneer homes were unscreened, flies, mosquitoes and gnats had free access. Flies swarmed, partly because of unsanitary conditions around the home. About 1782 J. Hector St. John de Crèvecoeur, who operated a farm near Carlisle, had a unique method of ridding his house of these annoying scavengers: "He brings in a hornet's nest filled with hornets from the woods and suspends it from the center of the room. Here, being unmolested, they do no harm to any of the family but, pleased with their warm and dry abode, they catch and subsist on numerous troublesome flies. These they constantly catch on the persons and even the faces of his children." [37] It would seem that this reciprocal benefit must have had certain disadvantages.

Mosquitoes and gnats were far more troublesome than at present because much of the land was still in forest, and swampy land was not drained. In 1749 Peter Kalm spoke out of bitter experience: "In day time or at night they come into the houses, and when the people have gone to bed they begin their disagreeable humming, approach nearer and nearer to the bed, and at last suck up so much blood that they can hardly fly away. . . . After a rain they gather frequently in such quantities about the homes that their numbers are legion. The chimneys of the English, which have no dampers for shutting them up, afford the gnats a free entrance into the house. . . . The inhabitants, therefore, make a fire before their homes to expell these disagreeable guests by smoke . . . When they stung me here at night my face was so disfigured by little red spots and blisters that I was almost ashamed to show myself." [38] Only by invoking the protection of a smudge made of rotten wood was life endurable at certain times, especially in early summer.

The same harassed traveller spoke feelingly, to say the very least, of his experience with fleas: "When I was obliged to lie at night in the huts and beds of the Indians I was so plagued by the immense quantity of fleas that I imagined I had been put in a burning fire. They drove me from the bed and I was very glad to sleep on the benches below the roof of the huts. But it is easy to conceive that the many dogs which the Indians keep breed fleas without end. Dogs and men lie promiscuously in the huts; and a stranger can hardly lie down and shut his eyes before he is in danger of being either squeezed to death or stifled by a dozen or more dogs, which lie round him and upon him in order to have a good resting place." [39] Many whites, also, shared their cabins with dogs.

Bedbugs were unwelcome guests in many farm houses, but the occupants became toughened to them, or at least resigned. Peter Kalm, who seems to have been a lodestone to all species of vermin, met them frequently in his travels. He says, "Some people have their bedposts made of sassafras wood to expel the bedbugs for its strong scent, it is said, prevents vermin from settling in them. For two or three years this has the desired effect, or about as long as the wood keeps its strong, aromatic smell . . . A joiner showed me a bed which he had made for himself the posts of which were of sassafras wood, but as it was ten or twelve years old there were so many bugs in it that it seemed unlikely they would let him sleep." [40]

Whether with or without these and other unlovely aspects of pioneer life, the farm home of colonial Pennsylvania still was a home in the best sense of the term. It was the center of family life; the children as well as their parents shared in its duties and responsibilities as well as in its pleasures and comforts. The words "family hearthstone" had deep significance then.



Making tallow-dip candles.

XVI

*Pounding corn
in a hominy block.*

FOOD AND CLOTHING

EFFORTS to provide the primary necessities of life—food, clothing and shelter—engrossed the time of settlers to the practical exclusion of other interests. Although their wants were few and simple they had to be wrested from the wilderness by unceasing toil and vigilance.

Pioneer farm women had to become acquainted with the preparation of many foods that they had not known in the Old World, particularly corn, squash and pumpkin. They had to learn how to use many unaccustomed wild fruits, herbs and roots. They had to become efficient in drying many kinds of meats, fruits and vegetables, for canning was not known, sugar was scarce and dear, and glassware or tinware not available.

Pioneer men were hearty eaters—they had to be to do the prodigious amount of work involved in carving a farm out of the forest. Farm women had to prepare food with few and primitive facilities and they had no effective means of keeping food fresh. Fortunate indeed was the housewife who had a cold spring in which to set crocks of food. Every thunderstorm "soured the milk."

Food Preparation

The first and for many years the only available means in the cabin for cooking was the open fireplace. In many farm homes west of the Susquehanna this was the only cooking facility until after 1840. The inconvenience and drudgery of fireplace cooking are recorded by a pioneer of Jefferson County:

"In 1840 every housewife in Brookville cooked over a fireplace in which a crane was fastened so as to swing in and out over the fire. . . .

Matches were not in use, hence fires were covered with ashes at night so as to preserve some live coals for the morning. Rich people had a little pair of bellows to blow these live coals into a blaze but poor people had to do the best they could with their mouths. After having nearly smoked out my eyes trying to blow coals into life, I have had to give it up and go to a neighbor to borrow a shovel of fire. Some old settlers used "spunk"—touchwood obtained from the inside of a hollow white maple tree—a flint and a barlow knife to start a fire. . . .

"The crane had a set of rods with hooks on each end, graduated in length so as to hang the kettle at the proper height from the fire. In addition to kettles we had the long-handled frying-pan, the three-legged short-handled spider and the griddle for buckwheat cakes. Then there was the bake-kettle or oven, with legs and a closely fitted cover. In this was baked the pone for the family. I can say truthfully that pone was not used more than thirty days in the month.

"This was a hard way to cook. Women would nearly break their backs lifting these heavy kettles on and off, burn their faces, smoke their eyes, singe their hair, blister their hands and scorch their clothes." [1]

Bread and other baked goods were cooked in the three-legged bake kettle or "Dutch oven," which was set on the fire and live coals heaped over it. If the bed of coals was too deep for the pot-legs, the oven was hung from above by pot-hooks. Old housewives contended that bread baked in stone ovens was not comparable in quality to that baked in Dutch ovens. Bread also was baked in iron-door brick ovens built into the chimney on one or both sides of the fireplace. Sometimes these had a smoke take-up into the chimney and an ash pit. These ovens were commonly heated once a week by burning wood within them until the bricks were hot; then the coals and ashes were swept out, the chimney draft closed and the oven filled with bread, pies, and perhaps a pot of beans. Sometimes stone or brick baking ovens were built at a little distance from the house, with or without a roof.

The most important utensil of fireplace cooking was, quite naturally, the dinner pot, a stewing kettle holding five to ten gallons and weighing twenty or more pounds. Into this went meat and the several kinds of vegetables that entered into the making of a stew. It was commonly of iron; if of brass or copper, it was the pride of the housewife and the envy of her neighbors. She and her daughters kept it polished until it shone, and it was handed down as a family heirloom. "It was not uncommon," says Thomas A. Glenn, "for a Welsh farmer in the Welsh Tract to leave one of his daughters 'my best copper pot' as a token of his affection. Such a bequest, in these days of extravagance, may seem absurd; but when we consider that even as late as 1720 a large copper pot or kettle was worth as much as a negro slave, namely £30 (or $150 our money) the gift appears in a different light." [2]

Meats were fried on the coals in a spider or skillet or were roasted on a spit before the fire, with a dripping pan beneath. A primitive method of roasting a fowl or joint of meat was to suspend it in front of the fire by a cord tied to a rafter. The meat had to be turned frequently, usually by hand, but advertisements of a mechanical turner appeared in Franklin's *Pennsylvania Gazette* in 1740.

Not until after 1840 did farmers begin to board up their kitchen fireplaces and install closed cooking stoves. At first they were suspicious of these new contraptions. By 1870, however, any farmer who still allowed his wife to cook over an open fireplace was considered by his neighbors to be either desperately poor or lacking in appreciation of her arduous duties.

The staple diet of early Pennsylvania farmers was "hog and hominy". In late summer and early autumn, while corn was soft, it was prepared for cooking by grating. A half-circular piece of tin was perforated with a punch or nail and attached to a block of wood. Corn on the ear was rubbed over it.

When corn was too hard to grate, it was reduced to meal in a hominy block. Two methods of grinding corn and other cereals were used by settlers who were remote from grist mills—pounding it in a mortar with a pestle or grinding it in a hand mill. Both methods had been used in the Old World for centuries; only the mortar and pestle method was known to Indians.

The mortar of the first settlers, like that of the Indians, was a large block of wood. The pestle was a long, rounded stone weighing ten or twelve pounds, or a long, rounded block of wood. The mortar hole was a foot or more deep and considerably wider at the top than at the bottom so as to facilitate the movement of the pestle. The hole was burnt out.

The settlers soon improved upon this primitive method by suspending a heavy pestle from the top of a small sapling; the spring of the sapling lifted the pestle and so lessened the labor. Frequently a mortar was fashioned by cutting off a tree about three feet from the ground and hollowing it out. This device was called a "hominy block" or "sweep and mortar mill". Sometimes a sapling thirty or more feet long was cut for use as a sweep. The butt end was inserted under the cabin wall or under a stump; it was supported in the middle by a forked stick so as to elevate the tip about fifteen feet from the ground. To the tip was attached a small log about six inches in diameter and eight feet long, the lower end of which was rounded into a pestle. This device greatly expedited grinding. The thump of the heavy pestle in the mortar could be heard a mile or more away; sometimes it was used as a means of communication between neighbors.

Joseph Doddridge recalls the hand-made methods of grinding grain in the first settlements of southwestern Pennsylvania, about 1763: "The hommony block and hand-mills were found in most homes. . . . The hand mill was made with two circular stones, the under one being the bed stone and the upper one the runner. These were placed to run in a wide hoop or band with a spout for discharging the meal. The runner was moved by a staff passed through an upright affixed to the runner. Such mills are still used in the Holy Land, as alluded to by our Saviour when he said, 'Two women shall be grinding at a mill'." [8]

When there were a sufficient number of farmers in a neighborhood to justify it, small custom "corn-cracker mills" operated by water power were built. These were a big improvement over hominy blocks although the farmer had to bolt the meal. Ultimately community grist mills were built. A pioneer farmer who was so blessed with this world's goods as to possess a wagon would collect grain once a month from his neighbors and take the grist to mill; or each farmer carried his own grain to mill on horseback, frequently many miles.

Corn was merely hulled. A peck or more of shelled corn was soaked over night then boiled in a large iron kettle with lye from wood ashes; then the hulls could be easily removed. After this hulled corn had been soaked or rinsed several times in clear water it could be cooked or stored.

SERVING MEALS

The table dishes of early settlers were mostly of wood and home-made. A few pieces of pewter—platters, porringers or tankards—might have been brought from Europe; these were highly treasured and were used only on special occasions. Perhaps there were a few pieces of heavy earthen-ware, made in England or Germany. There was practically no chinaware or glassware. A few colonial families might have a little silver; this was solid, not plated, and was brought out only on state occasions.

The most important table dish in early days was the trencher, a substitute for a plate. This was made of hardwood, preferably red or sugar maple; it was ten or twelve inches square and three or four inches deep. It was merely a block of wood hollowed out. On the frontier pieces of birch bark might suffice as plates for a time.

Knives were used not only to cut food but also to convey it to the mouth. Forks were practically unknown until after the Revolution, though they had been used somewhat in England since the reign of Queen Elizabeth. Spoons were the most important table utensil since much of the food came from the great dinner pot as "spoon meat"—stewed meat and vegetables. Most spoons were made of wood, commonly laurel, which was called "spoon wood". Some were made of horn.

The most common drinking vessels were wooden tankards and noggins. On the frontier gourds were used as dippers, cups, bowls, bottles and jugs. Leather drinking cups, bottles and large jugs called "blackjacks" were in common use.

As the family prospered, pewter gradually replaced wood and leather. As late as 1840 the tableware of farm families in central and western Pennsylvania was mainly wood and pewter. "The furniture for the table of the pioneer log cabins," says W. J. McKnight, "consisted of pewter dishes, plates and spoons; or wooden bowls, plates and noggins. If noggins were scarce gourds and hard-shelled squashes answered for drinking cups. The iron pots, knives and forks were brought to the wilderness on pack horses."[4] A set of pewter was a popular gift to a bride from her parents. It was kept burnished until it shone like silver by frequent rubbing with scouring rushes *(Equisetum avense)*. After 1820 light, plated tin ware from the peddler's cart gradually replaced pewter. Not until after 1840 was chinaware and plated silver common in farm homes.

The home-made dining table of the large majority of pioneer farmers was long and narrow, usually not over three feet wide. It had no legs; rough "table boards" were laid loosely on moveable supports like sawhorses. The table was removed after the meal so as to provide more room in the cramped kitchen. In some homes the boards were covered with a linen "board cloth". The legal notice of a husband about an erring wife who had "left my bed and board" is derived from table boards. The family sat on narrow wooden benches. Frequently children were not permitted to sit at the board but stood beside it during the meal, eating only what their parents passed to them.

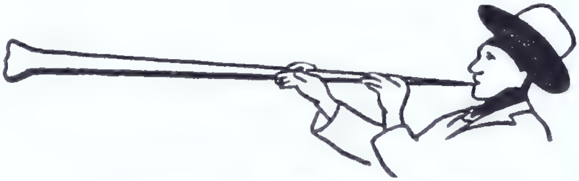
Food was conveyed to the mouth with fingers, knife or spoon. People became very expert in loading the broad blade of a knife with food and balancing it there precariously until the mouth engulfed it. Even the elusive pea was conveyed to its intended destination by this useful tool. The ancient rhyme,

> I eat my peas with honey;
> I've done it all my life.
> It makes the peas taste funny
> But it keeps them on my knife.

was based on fact, not fancy, but few farmers felt the need of using this adhesive. Even after wide-spreading two-tined forks with massive buck handles were available, most people continued to eat with knives.

Sometimes a great pot of stewed meat and vegetables or other *piece de resistance* was set on the table-board and all the family and guests gathered around it and helped themselves directly from the pot with long-handled spoons. Frequently two persons, as man and wife, ate from one trencher. A one-dish meal was not considered a privation; variety was thought to be less important than quantity.

Individual drinking cups were not common; usually all the family drank from a large noggin, which passed from lip to lip, for they were blissfully unaware of the existence of bacteria or germs. This communal sharing of the cup extended to hospitable drinking with strangers, both in the home and at taverns.



Blowing the long dinner horn.

SUBSTANTIAL FOOD

The table-boards of prosperous farmers groaned under the weight of substantial food set upon them. It was nutritious but not nearly as varied as farm fare today since practically all of it was produced on the farm or secured from the wild; very little was bought except salt, sugar, spices, tea, coffee and molasses.

Farm families were hearty eaters; they worked hard and did not stint themselves at the table. No fear of dyspepsia limited their meals. "The homes of the more prosperous farmers," says John T. Scharf, "were provisioned as to stand a siege. Cellars had great bins for apples, potatoes, turnips, tiers of barrels of cider and other drinks, barrels of sauerkraut. In the garret were firkins of apple butter, festoons of dried onions, peaches and apples, and great bundles of dried herbs. In the storeroom were shelves full of stone jars filled with pickles and glass jars of preserves of every sort. They salted, cured and smoked their own bacon, beef, venison and mutton." [5]

In towns, people of means had great variety as well as great quantity of food. In 1787 an abstemious New England Yankee, Dr. Cutler, was a guest at the home of a Philadelphia Quaker. He recorded in his diary, "This plain Friend, with his plain but pretty wife, with her Thees and Thous, has provided us a costly entertainment; ducks, hams, chickens, beef, pig, tarts, creams, custards, jellies, fools, trifles, floating islands, beer, porter, punch, wine, etc." He considered the fare of this hospitable Quaker "a most sinful feast".

Not bread, but meat, was the staff of life for most pioneer farmers. This was partly because it was so abundant in the wild but chiefly because pork could be produced so easily from hogs that foraged in the woods for practically all their food. Frontier farmers who had not yet accumulated much livestock lived largely on deer, bear, turkey, grouse, pigeon, squirrel and other wild meats. Bear and opossum fat was rendered into lard which was stored in deerskin bags, as Indians had done for centuries.

Salt pork was standard fare the year round; beef was secondary. Every farmer slaughtered his own animals, usually with the aid of his neighbors. After crops had been harvested, fall seeding done, the winter's supply of firewood cut and piled, and the approach of winter was heralded by a few chill November days, butchering was in order. It was a gala occasion on the farm, not only because fresh meat was a welcome change in the diet but also because of the participation of neighbors. A forty or fifty-gallon kettle was hung over an out-of-door fire to heat water for scalding the carcasses. Another kettle was used to try out the lard. Oxen, old cows, sheep and swine were slaughtered in early morning so that their meat might be hard and cold when put into pickle at nightfall.

Butchering was a busy time for the housewife. The meat must be pickled, smoked, dried, salted and potted so that it would be available throughout the year. Barrels were filled with pork and packed in brine and tubs with lard. Hams, shoulders and sides of bacon were hung in the smokehouse to cure. There was sausage to make, lard to try out, tallow to save. A truly amazing number of food products was made from hog meat—salt pork, bacon, ham, souse, scrapple, head-cheese, cracklings, spare-ribs, jowls, pickled pig's feet and many others. A goodly supply of beef was dried, corned or smoked, but the backbone of farm fare throughout the year was hog meat.

The standard cereal food of pioneers was corn meal. This was prepared in manifold ways but mainly as pone or hoecake. Corn meal mush and milk were staple foods. Wheat was the chief cash crop; it was so valuable that the wheaten loaf was found on the tables of few farmers—rye bread was much cheaper and equally nourishing. A crock of home-made yeast was kept in the cellar. Enough dough for a week's supply of bread was kneaded and set to rise in the doughtry. "For a long time," says Henry B. Plumb, "saleratus for cooking was very scarce in the Wyoming Valley. As a substitute they used corn cobs burned to ashes and allowed to settle; the clear water was used in place of saleratus as late as 1825." [6]

Pancakes were a prime favorite, especially when covered with maple syrup or, in later years, amber New Orleans molasses. The housewife prided herself on the dexterity with which she could turn pancakes by tossing them into the air and catching them in the pan, fried side up.

Vitamins and other diet lore were unheard of, but our rural forefathers well understood the desirability of eating fruits and vegetables in quantity. The supply of wild small fruits was adequate but there were no very edible native tree fruits except in the vicinity of Philadelphia, where peaches had become naturalized. Canning was not known until after 1800 so the rural housewife resorted to drying and preserving. She and her children picked great quantities of wild strawberries, blackberries, raspberries and huckleberries to dry or to preserve with honey. One of the first operations of a pioneer farmer after he had cleared a little land was to plant an orchard, mainly apple and peach.

Henry B. Plumb recalls early days in the Wyoming Valley: "Every family picked quantities of huckleberries, blackberries, raspberries and large quantities of apples, peaches, pears, plums, cherries and dried them for winter use. Many bushels of fruit also were preserved by cooking them with an excess of honey. Sugar was not available for this purpose until after 1840. Chestnuts were gathered in bushels, also hickory nuts, black walnuts, butternuts, hazelnuts—enough to last until nuts came again."[7] Spiced fruits, candied fruits, marmalade and other preserves were popular. There were no hermetically sealed jars then; large crocks were filled with preserves so rich in sugar or honey that it was not necessary to keep air from them to prevent fermentation.

Sauerkraut was the most important appetizer and source of vitamins during the winter months. It was made by packing cabbages in salt and changing the brine from time to time during the process of fermentation. Sweet corn, beans, pumpkins, squash and other vegetables were dried. Next to sauerkraut, "Dutch cheese" was the most popular appetizer. It was made by adding finely cut sage leaves to cottage cheese.

Most of the apple crop that was not converted into cider was then dried or made into apple butter. Pared and sliced apples were strung on linen thread and hung from the kitchen rafters or in the attic to dry. They accumulated a layer of fly specks but these were considered innocuous. Perhaps several barrels of apple butter were made. The great brass or copper kettle hanging from the crane was filled with pared apples, sweet and tart, in the right proportion and boiled down with cider. Tart varieties were placed at the bottom of the kettle because they required more cooking than sweet sorts. Bins of fresh apples gave a delightful aroma to the cellar.

After apple orchards came into bearing, apple pie was the almost universal dessert. Writing about the Swedes in 1759 Acrelius said, "Apple pie is used through the whole year and when fresh apples are not longer to be had, dried ones are used. It is the evening meal of children. House-pie, in country places, is made of apples neither peeled nor freed from their cores, and the crust is not broken if a wagon wheel goes over it."[8]

Until sometime after 1820 salt was extremely scarce and costly. It was needed not only for table use but also for preserving pork, fish, butter and other farm products. At first the settlers imported salt from Europe, later from the West Indies. A little could be secured from salt licks. In 1759 Peter Kalm reported, "The salt which is used in the

English North American colonies is brought from the West Indies. The Indians have in some places salt springs from which they get salt by boiling. Mr. Franklin was of the opinion that the people of Pennsylvania could easier make good salt of sea water as in New England, where sometimes salt is made of sea water." [9]

Salt works for evaporating sea water were established on Cape Charles, Virginia, as early as 1620. In 1642 the Governor of New Sweden was instructed to engage in salt making. For a time the Dutch and English continued to secure most of their salt from sea water, using either the sun or artificial heat to evaporate it. It was a slow process and salt was very costly until the West Indies supply became available. During the Revolution, when this supply was cut off by blockade, the colonists again were forced to make salt from sea water. In 1776 the Continental Congress circulated a pamphlet, "The Art of Making Common Salt Particularly Adapted to the Use of the American Colonies". This was a reprint of an article first published in *Pennsylvania Magazine* for March of that year.

Salt was a very important factor in the settlement of western Pennsylvania. At first it was carried across the Alleghenies by pack horses; four bushels was the customary load. This made it very expensive. On November 24, 1778, the court of Youghiogheny County, Virginia (now Washington County, Pennsylvania) ordered that the allotment of salt to that county "be issued to the inhabitants to whom it is due at six pounds ten shillings per bushel". [10] According to Joseph Doddridge, a southwestern Pennsylvania pioneer, the common price of a bushel of salt in early days was "a good cow and her calf". So precious was it, says Doddridge, that "no one was permitted to walk heavily over the floor while the operation of measuring it was going on." [11] In 1790 salt sold for $8.00 a bushel in Pittsburgh.

Salt was an important means of exchange. About 1800 salt from deposits in western New York, at Onondaga (Syracuse) and Salina began to come into western Pennsylvania. In that year the port of Erie received 723 pounds of Onondaga salt; nine years later, 14,346 pounds. It was moved by ox team from Salina to Buffalo, thence to Erie by sail boat and from there to Waterford by ox team. At Waterford it was loaded on flatboats and moved down French Creek to Franklin, thence by the Allegheny to Pittsburgh. On December 12, 1805, "Eleven flat-bottomed and six keel-boats passed by this place [Meadville] during the last freshet in French Creek, the former carrying an average of 170 and the latter 60 barrels of salt each. . . . The selling price at Pittsburgh is now $13 a barrel." [12] During the next few years the volume of salt shipments on this frontier waterway increased greatly. In 1809 it was recorded, "There are at present at Waterford upward of 14,000 barrels of salt containing five bushels each awaiting the rise of the waters in order to descend to Pittsburgh, Wheeling and Marietta." [13]

The history of the salt trade through Erie and down French Creek has been sketched by Benjamin Whitman: "The hauling of salt over the portage between Erie and Waterford, and the floating of it down French Creek, gave employment to many farmers, as their land barely furnished food for their families. . . . The trade commenced about 1800 and continued until 1819. . . . The salt was bought at Salina for 60 cents a bushel and the price at Erie and Waterford ranged from $5 to $12 a barrel. It required from two to three months to convey it from Salina to Pittsburgh. There was a period when salt was almost the only circulating medium in Erie County. Oxen, horses, negro slaves and land were sold, to be paid for in so much salt. . . . A yoke of oxen was exchanged for eight barrels. . . . The discovery of salt wells on the Kiskiminitas and Kanawha, about 1813, cheapened the price of the article at Pittsburgh so that Salina salt could not compete." [14]

After 1813 salt deposits in western Pennsylvania, near the present site of Saltsburg, began to supply local needs. By 1840 Pennsylvania was the leading salt-producing state in the Union. Salty brine was pumped up from a depth of 500 to 700 feet and evaporated in huge vats heated by bituminous coal fires. Soon the price of unrefined salt at the plant was reduced to twenty-five cents a bushel.

Until after 1840 the sweetening on the groaning tables of most farm families, except on special occasions, was maple sugar or honey, sometimes molasses. Cane sugar from the West Indies was scarce and dear. In 1792 loaf sugar cost fifty cents a pound in Crawford County. Granulated sugar was unknown then. The top shelf of the country store held a row of loaves or cones of hard sugar, weighing eight or ten pounds each. They were wrapped in blue-purple paper, which was carefully saved and soaked to secure the indigo dye in it. Most farm families made one loaf suffice for a year. The housewife cut it into small lumps with sugar cutters, using infinite care, for every grain was precious.

After 1820 when the cane sugar industry of Louisiana began to assume commercial importance, cheap grades of brown sugar and molasses were used on farms. Large families bought New Orleans molasses by the barrel; the moist brown sugar at the bottom of the barrel was the small boy's delight. Granulated sugar was not used commonly on farms until after 1840.

For the most part, colonial farmers made their own sugar from sugar maple trees, which were plentiful throughout the state. Sugar making came conveniently at the end of the winter when other out-of-door work was at a standstill. The average farm family tapped 200 to 300 trees and made 500 to 1,000 pounds of sugar every year. Syrup, but not sugar, was made from the soft maple. Buckwheat cakes and maple syrup were an epicurean delight in rural Pennsylvania.

From the earliest days of settlement honey was by far the most important substitute for sugar. It was used not only at the table as "long sweetening" but also for preserving fruits. Black or German honey bees were brought to Pennsylvania by the early settlers; bees were not native to America. The Indians called them "white man's flies". Swarms quickly went wild and soon filled hollow trees all over the province with honey.

Pioneer farmers used wild honey almost exclusively; few kept bees. According to Gabriel Thomas, in 1698 "bees thrive and multiply exceedingly. . . . The Swedes often get great store of them in the woods where they are free for any Body. Honey (and choice, too) is sold in the Capitol City (Philadelphia) for Five Pence per Pound. Wax is also plentiful, cheap and a considerable Commerce." [15]

Some farmers became expert at "lining bees"—following them in their flight to their store houses in "bee trees". Bee hunting was a popular pastime. September and October were the best months, but expert bee hunters began to line up bees in early spring, particularly when basswood was in bloom. Their observations were facilitated by the well-known habit of bees to fly back to their store on a straight line—a "bee line". Cutting down a bee tree to secure the honey was adventurous and sometimes dangerous, even though smoke was used to stupify the bees and drive them from their home.

Ordinarily bee trees yielded from fifty to seventy-five pounds of honey, but sometimes much more. The year 1832 was notable as a good honey year. Sixteen gallons of excellent honey were taken from a tree in Crawford County. In the same year, "From a large Pine tree in Clearfield County was taken over 200 lbs. of comb honey and 11 gallons of liquid honey." [16]

As settlement progressed and forests were cut down, wild bees could no longer be depended upon to supply honey; farmers began to keep bees. By 1840 a few "scaps" or "gums" of bees were considered a necessary adjunct to every well managed farm. Henry B. Plumb describes bee keeping in the Wyoming Valley: "The bees were kept in a yard fenced off by itself, usually an apple orchard. They were watched carefully for swarming. A hive usually produced two swarms a year and the first swarm would produce another the same season. When a swarm had passed the second year the bees were killed and the honey (about 40 lbs.) taken. The honey, when stored in a tub holding 200-600 lbs. would granulate in a few months but never got hard or dry. This "candied" honey was the main sweetening material for all purposes." [17]

VALIANT TRENCHERMEN

Each of the nationalities that comprised the majority of settlers had a characteristic diet. This was the result of inherited preference as well as limitations in production.

In 1759 Israel Acrelius recorded the dietary habits of his Swedish countrymen after they had been in Pennsylvania more than a century. "The arrangement of meals among country people is usually this: for breakfast in summer cold milk and bread, rice, milk pudding, cheese and butter, cold meat. In winter, mush and milk and milk porridge, hominy and milk. The same also serves for supper if so desired.

"For noon, in summer, soup, fresh meat, dried beef and bacon with cabbage, apples, potatoes, Turkish beans, large beans, all kinds of roots, mashed turnips, pumpkins, cashaws and squashes. One or more of these are distributed around the dish. Also boiled or baked pudding, dumplings, bacon and eggs, pies of apples, cherries, peaches, etc.

"In winter, hominy soup is cooked with salt beef and bacon. Then, also, pastries of lamb or chicken are used and can keep cold a whole week; also pancakes of wheat flour or of buckwheat meal. Bread is baked once a week or oftener. It is in large loaves, mostly of wheat flour, seldom of rye. The flour in the country is dark and coarse." [18] Beer was the standard beverage and much wine was made from native grapes.

John F. Watson, Philadelphia historian, has reported the diet of English farmers of Bucks County about 1730: "For common living, milk and bread and pie made the breakfast, the milk being boiled and sometimes thickened in winter; good pork or bacon with plenty of sauce, a wheat flour pudding or dumplings with butter and molasses for dinner; and mush or hominy with milk and butter and honey for supper. Pies of green or dried apples were the universal standard of good eating, especially with children. When milk was scarce small beer thickened with wheat flour and egg, or cider in that way, made an agreeable breakfast." [19]

"Pop-robin," a combination of eggs and flour made into a batter and boiled in milk, was a favorite breakfast dish. Cabbages, potatoes, turnips, beans and peas were the most common vegetables. The cellars were filled with apples, beets, and carrots; potatoes, cabbages and turnips were buried in large heaps in the garden for winter use.

The diet of English settlers from Connecticut in the Wyoming Valley featured salt pork and buckwheat cakes. Says Henry B. Plumb, "Breakfast, dinner and supper among the farmers were very much alike. . . . A common dish was a large, deep wooden or pewter platter filled high with boiled potatoes, cabbage and salt pork or corned beef. At every meal there was a large dish of fried salt pork swimming in its own fat. There was plenty of wheat or rye bread, butter, cheese, milk, buttermilk, cider, frequently a large dish of baked beans with a large piece of pork baked with it, radishes, green peas in their season, green corn and succotash. . . .

"In the winter the principal bread food was buckwheat cakes. Tea and coffee were used only on special occasions. It was only when they killed a beef, calf, sheep or hog that they had fresh meat . . . their meat was all salt meat except venison and bear meat. Corn mush and milk was a favorite dish for children. Indian pudding and pumpkin pies were also in great demand; and after butchering, sausages and mince pies were in daily use." [20]

Naturally, the sturdy Pennsylvania German tillers of the soil were hard workers and hearty eaters; they did not stint themselves at the table. In general, there was less meat and more vegetables, especially cabbage, in their diet than in that of other groups. They used rye bread instead of wheat bread for reasons stated by Benjamin Rush in 1790:

"The German farmers . . . sell their most profitable grain, which is wheat, and eat that which is less profitable but more nourishing, that is rye or Indian corn. The profit to a farmer from this single article of economy is equal, in the course of a life time, to the price of a farm for one of his children. They eat sparingly of boiled animal food, with large quantities of vegetables, particularly sallad, turnip, onions and cabbage, the last of which they make into *saur crout*. They likewise use a large quantity of milk and cheese in their diet . . . Very few of them ever use distilled spirits in their families; their common drinks are cyder, beer, wine and simple water." [21]

Germans ate little beef but consumed pork in manifold ways. They loved *sauerkraut und speck* (sauer kraut and fat pork), *brothwürscht und lewerwürscht* (sausage and liver pudding), *aepfelküchelcher und drechter* (apple fritters and flannel cakes), *schnitz und knopf* or *snitz und knepp* (dried sliced apples and dumplings cooked with pork), *schmier-käse* or *smear-case* (cottage cheese), *liverwürst* (meat pudding) and many other dishes not familiar to their English and Scotch-Irish neighbors. Their capacious cellars were redolent with the pungent odor of barrels of sauer kraut. The German *hausfrau* was a famous cook; her table groaned under a wide assortment of appetizers, pastries and preserves.

Compatriots of Robert the Bruce, the pioneer Scotch-Irish, most of whom lived on the frontier, were more dependent on their rifles for meat than other groups but they, too, were partial to "hog and hominy". Being Scots, they were desolate without oatmeal porridge, but corn meal mush was more readily available. "Pioneer farmers (mostly English stock) in southwestern Pennsylvania," says Joseph Doddridge, "depended much on lean venison and wild turkey and often the flesh of bear. Anxiously the children looked for the first growth of the potato, pumpkin, squash &c. When the young corn came it was a perfect jubilee to use them for roasting ears and afterwards, when hardened by age, to grate them on a tin grater for Johnny Cakes (journey cakes)."

The main articles in the fare of pioneer Scotch-Irish farmers in western Pennsylvania are listed by W. J. McKnight: "Buckwheat cakes, corn mush and milk, rye mush and milk, bread, hominy, potatoes, turnips, wild onions or wramps, hog meats, wild meats, fish and wild fruits were the main foods. Everything was boiled or baked, not fried. The most common dishes were wheat and rye bread, wheat and rye mush, Indian corn pone, doughnuts and baked pot pies . . .

"The wild meats were bear, elk, deer, rabbits, squirrels, woodchucks, and turkey and partridges in some areas . . . The saddles or hams of deer were salted, smoked and dried, then they could be kept all the year. The old settlers shot, seined, gigged and hooked fish—pike, catfish, suckers, horn-chubs, trout, eels, bass. Wild birds were plentiful—grouse, ducks, geese, pigeons, turkeys . . . Frequently whole flocks of turkeys were caught in a log pen trap covered with brush. Wild fruits were abundant—crabapples, red and yellow plums, blackberries, huckleberries, elderberries, strawberries, choke cherries, raspberries, gooseberries." [23]

Ordinarily Johnny cake or pone was the only bread for breakfast and dinner; for supper, porridge or mush and milk. When there was no milk, mush was eaten with molasses, honey or meat gravy. Desserts were few, but occasionally green or dried apple pies appeared on the table, to the unconcealed joy of the children. The Scotch-Irish garden yielded roasting ears, potatoes, squash, pumpkin, beans and turnips.

BEVERAGES

Our rural forefathers slaked their not inconsiderable thirst in alcoholic beverages, seldom in water. Most of them had an aversion to water for drinking purposes believing that it induced malaria and other ills. They preferred "comfortable drinks," both fermented and spirituous.

The standard beverage of the early Swedish settlers was home-made beer. In 1685 William Penn reported to friends in England, "Our Drink has been Beer and Punch made of Rum and Water. Our Beer was made mostly of Molasses, which, well boyled with Sassafras or Pine infused into it, makes very Tolerable Drink; but now they make Mault and Mault drink begins to be common." [24]

Nearly every Swedish farm had a malt house for brewing "small beer". Foaming pitchers of beer were served at every meal. It was made of hops, ginger, spruce, sassafras roots, barley (sometimes wheat), molasses, yeast and water. With the coming of the English the list of beverages was extended; in 1750 Acrelius listed forty-five kinds of wine, claret, rum, whiskey, beer, brandy, cider and other liquors that were drunk freely by the "upper classes". He added that milk, water and beer were the drinks of the "common people". Rum made of molasses was a by-product of trade with the West Indies, long the chief export market of the colony.

After 1720 apple orchards began to yield their splendid crimson and golden harvest and cider became the standard beverage of farmers of all nationalities. Practically every farmer had an orchard large enough to put fifteen to forty barrels of cider into his cellar every year. It was not considered to be "prime" until it was over a year old, and very "hard". All the family drank cider, with thirst the only limitation. When milk was scarce, sweetened cider diluted with water was given to little children. Every farm had some crude kind of cider mill. A common type consisted of two wooden cylinders powered by a horse walking in a small circle; three hours were required to grind a cartload of apples.

Other fermented or distilled fruit juices were popular. Pears were crushed to make pear cider, or perry. Cider was distilled to make the much more potent apple-jack. Cider royal was new cider fermented with apple-jack. Peach brandy was an especially popular source of comfort in the southeastern counties. Metheglin was a favorite drink in the northern and western part of the state. This was a fermented mixture of honey, cider and water; though sweet it was effective in stealing away the senses.

Reporting on conditions about 1760 Robert Proud says, "Cyder is the common drink of this country and very plentiful and easy to be procured . . . West India rum and spirits are much drank in mixture by people in general. Malt liquor, which among the first settlers was more common, now is made in small quantity . . . This seems to arise, at least in part, by getting rum and spirits at such exceedingly low rates from the West Indies, which has rendered malt liquor, though more wholesome, less used than formerly . . . notwithstanding this is so great a grain country." [25]

The Scotch-Irish brought with them a very persistent taste for whiskey. By the time of the Revolution distillation of whiskey, mainly from corn and rye, was common throughout the province. Small stills operated by farmers were numerous. Whiskey was not only the standard beverage in farm homes of western Pennsylvania but also an important commercial farm product.

The whiskey of that period could be drunk in considerable quantity without intoxication, especially by men who were engaged in arduous out-of-door labor and who ate prodigious quantities of coarse food. All the family drank whiskey; even little children sometimes were given bread soaked in whiskey instead of milk. Visitors to homes of Scotch-Irish, including the minister making a pastoral call, were expected to take a drink of whiskey when they arrived and again when they departed. If the minister made, say, ten or twelve pastoral calls a day he was likely to be in a mellow mood by evening. In 1794 Tench Coxe of Philadelphia drew up a plan for a "model farm settlement" on the Susquehanna. It called for one grist mill, one brewery and ten distilleries. By 1800 there were more distilleries in Pennsylvania than grist mills.

Farm workmen were supplied with whiskey in quantity; it was thought that a farm could not be operated successfully otherwise. In 1825 the Philadelphia Society for Promoting Agriculture offered "A Gold Medal of the value of fifty dollars to the person who shall have carried on farming in Pennsylvania on the largest scale without using or suffering to be used on his property any ardent spirits (except when prescribed by a physician) for a period of two years."[26] There was no claimant for this premium. After 1840 the use of whiskey as a farm beverage gradually declined.

Tea and coffee were unknown and so were not used by the first settlers; they were not known in Europe at that time. Importations of tea began about 1700. By 1759, according to Acrelius, tea was used, but only on special occasions. Not until after the Revolution did many farm families drink tea—it was too expensive. When butter was 12½ cents a pound, eggs six cents a dozen and tea fifty cents to $1.50 a pound few farmers would barter their products for this luxury. Coffee came into use about 1740 but did not become the great American beverage, supplanting tea, until after 1840.

On the frontier, where it was difficult or impossible to get tea or coffee, numerous substitutes were used. Decoctions of mint, thyme, sage, sweet fern, pennyroyal, sassafras, catmint, raspberry leaves, winter green and other herbs were thought to be fairly satisfactory substitutes for tea. By stretching the imagination, beverages made from roasted grains—wheat, rye, barley, corn—or roasted chestnuts could be considered a reasonable *facsimile* of coffee. In 1814, when the country was feeling the paralyzing effect of the blockade of the War of 1812, a Philadelphia newspaper, noting that the price of coffee had risen to a point where it was almost prohibitive to the poor, recommended as a substitute, "potato coffee," made of dried and roasted potatoes. This was said to "resemble coffee in taste, smell and colour" and to "sit lightly on the stomach, is nourishing, easy of digestion and does not irritate the nerves of weak persons." Notwithstanding these encomiums, it did not meet with an enthusiastic reception, even from the poor.

CLOTHING

The clothing of Swedes and other pioneer settlers along the Delaware, also of frontier families of a later period, necessarily was home-made and coarse, though serviceable. It was made mostly of skins of wild animals, mainly deer and bear. Underclothing was not worn then. The men wore breeches and jackets and the women jackets and skirts (then called petticoats) of enduring buckskin. Many farmers also wore leather aprons which reached below the knees and covered most of the breast. Knee "britches" or "small clothes" were worn instead of long trousers; they were fastened at the knee with a buckle. Leather leggins and moccasins completed the apparel. Hats, if any, were of beaver skin in winter and rye straw in summer.

Nils Gustafson, a pioneer Swedish farmer, told Peter Kalm, "The men wore waistcoats and breeches of skins . . . Their shoes were often of their own making . . . They took the length of their feet and sewed the leather together accordingly, taking a piece for the sole, one for the hindquarters and another for the uppers. These shoes were called 'kippacks' . . . The women were dressed in jackets and petticoats of skins."[27] There were no "fashions" then.

For many years during pioneer times each family tanned its own leather. Tanning was not known to the Indians; they prepared skins for use as clothing by kneading and scraping. The settlers soaked skins of cattle and wild animals in lye made from wood ashes to loosen the hair so that it could be easily scraped off. Then they were soaked for several days in a strong decoction of tannin made from oak or hemlock bark. A large wooden trough sunk into the ground served as a tanvat. After being soaked in tannin the skins were dried, scraped and softened by pounding them on a block of wood with a mallet and rubbing in bear grease or tallow. They were curried with a draw-knife with a turned edge and darkened, when desired, by applying a mixture of lard and soot.

Eventually the necessity of tanning hides on the farm was obviated by the establishment of custom tanneries. Referring to conditions in the Wyoming Valley about 1790 Henry B. Plumb says, "Tanneries were established almost in the very beginning of the settlements. The tanning was generally done for half the hide. Thus the farmers had all their own leather made from the hides of their own cattle, horses, sheep, dogs and sometimes hogs and from deer skins. They had only to pay for the making of it into shoes, boots, clothing, saddles, mittens, etc. It cost three shillings and ninepence (fifty cents) to four shillings and sixpence (sixty cents) to get a pair of shoes made. Public officers were elected in general town meeting to see that this work was properly done. These officers were called Leather-Sealers."[28]

Leather clothing began to give way to tow, woolen and linen garments in the eastern settlements about 1720 but was common on the frontier until after the Revolution. It was worn in the Wyoming Valley as late as 1830. Leather hunting shirts were worn in the western part of the state until after 1820.

As soon as the sheep population of the settlers had increased sufficiently and flax was grown more generally, leather clothing was replaced by homespun of wool and linen. Men wore breeches and jackets of tow, coarse linen or linsey-woolsey, which had a warp of flax and a woof of wool. "German settlers of York County," says W. C. Carter, "were clothed for some years altogether in tow cloth, as wool was not to be obtained . . . During the heat of the summer a shirt and trousers of tow formed the only raiment. In the fall a tow frock was added. The dress was adapted to the season by increasing the number of frocks. In the coldest part of the winter some of the sturdy settlers were wrapped in four, five and even more frocks."[29] An historian of Centre County relates, "It used to be said that no man was rich unless he possessed a long-barreled shot gun, a Brumgart plow and a red wamus —a short coat of home-made cloth, thick and tough as sole-leather and fiery red."[30]

Farm women wore short gowns and petticoats made of linsey-woolsey in summer and wool in winter. They covered their heads with hoods, shawls or sunbonnets. With the possible exception of her husband's broadcloth coat, which he had worn at his wedding and treasured for a life-time, the woman of the home made all garments for the family; her spinning wheel was seldom idle.

In later colonial days traveling tailors and shoemakers visited the homes of their rural patrons once or twice a year. The farmer laid in a stock of leather sufficient to make shoes for all the family and his wife a stock of homespun. The hand-made shoes and garments fashioned by these expert craftsmen gave much longer service than the machine-made goods of today. "I once saw a Pennsylvania German farmer who had on a pair of calf-skin boots that he had been wearing for forty-three years. They were his wedding boots and were, of course, only worn at dress parade."[31] Farm families seldom wore shoes in summer except on special occasions. "In pre-Revolution days," says Henry G. Ashmead, "it was considered effeminate to ride to church—men and women trudged along the highway barefooted, shoes and stockings in hand, and when they came near their destination sat by the road and put them on."

Nearly every prosperous farmer and his wife had a few "boughten" garments which were highly treasured and were bequeathed to their children. In 1756 a Lancaster County farmer willed to his children "One Pare of Blew Sedar Bridges, a Blew Coat, Unter Jacket Red lidge Collar with Sleaves, one Hatt, one Pare Shoes"; and in 1760 a wealthy farm woman of the same county disposed in her will of "my pink lutstring Gown, and Striped Gown, and cardinal Cloke; likewise two peticotes, one red the other white, and two aprons, my scarlet Cloke and Calico Raper, my Callico gown, my black quilted peticote, my striped Linnen gown and my Bible." [32]

About 1754 came "a reign of fashion" when the war between Great Britain and France resulted in much higher prices for farm produce, particularly wheat. With sharply increased purchasing power, some farm women began to adopt the fashions of the city. Garments made of imported fabrics began to replace homespun at least for "Sunday best". Silk dresses, feathered bonnets and other adornments dear to the hearts of women gradually replaced the plain but serviceable garb of earlier years.

The first manufactured fabric to challenge homespun in women's dress was calico. It was light, colored in attractive patterns, easily washed and comparatively cheap. By 1765 the shelves of most country stores carried bolts of calico and the whir of the spinning wheel was heard less frequently in farm homes. Calico was soon followed by worsteds and other imported fabrics.

Some farm men, also, were not immune to the new vogue. By 1775 the distinction between the dress of a "gentleman" and that of a farmer was not as marked as it had been since the foundation of the colony. Some farmers still wore leather aprons when at work but their "Sunday clothes" gradually became like those of city folks. During the Revolution, when the blockade cut off importation of fabrics, it was considered to be the patriotic duty of all citizens, even the wealthy, to dress in homespun; but this reversion to the dress of earlier days was of short duration.

After the Revolution Americans began to imitate the fashions of Europe assiduously. There was a constant succession of rich and gay modes for men as well as for women. City dandies wore their hair long, powdered it heavily and tied it in a queue. Some augmented their natural hair with long wigs, vulgarly called "false tails". These were made of human hair, goat's hair, cow's tails and what not. Some gentlemen had eight or ten wigs—a "tie wig," a "bob wig," a "riding wig," a "night-cap wig," and so on. These uncomfortable, unsanitary, expensive and ridiculous excrescences on the human male persisted until about 1800.

The well-to-do gentlemen of this period were gaily resplendent in lace-ruffled shirts, brilliantly colored waistcoats, tight-fitting topcoats, plush breeches of radiant hues and shoes with gold or silver buckles. This iridescent raiment was considered to be the hallmark of gentility. About 1790 long trousers, instead of knee breeches, began to be worn by the "common people".

Meanwhile the town women of this highly artificial period paraded in elaborate costumes of brocade, damask, velvet, silk and lace. They wore hoop skirts, high coiffures of puffed and rolled hair and other frills. *Godey's Lady's Book* of Philadelphia became the arbiter of feminine fashions. When ladies planned to attend a ball they had their hair built up into a pyramid of extraordinary shape, perhaps a foot or more high, held together by paste and other stiffening devices. They sat up all night before the ball and moved very carefully the next day so that the towering mass of powdered hair might not be displaced. During the ball they hardly dared to move their heads lest the head-dress fall, hence the minuet and other stately dances of the city, in contrast with the rollicking square dances and hoe-downs of rural Pennsylvania.

Much to the disgust of their elders, some rural young folks were dazzled by this hectic sartorial outburst of the city and sought to copy it. In 1782 a farmer whose son had just returned to the farm after spending several weeks in Philadelphia gave voice to his dismay: "His hair is besprinkled with powder so that it looks as white as that of a man eighty years old. A pair of ruffles reaches from his waistbands to the extremity of his nails. A strip of gold lace encircles his hat. A huge stock is worn around his neck containing muslin enough to be his winding sheet. A long piece of cold iron, called a sword, hangs at his side. He looks like a baboon!"

In vain did older folks on the farm rail against the new fashions, so different from the simple dress of their youth. Even some hitherto plain Quaker youth yielded to temptation and carried gold-headed canes, gold snuff boxes and wore great silver buckles on their drab coats and shoes. Except where restrained by stern religious and family discipline, as among German sectarians, rural people gradually succumbed to city fashions. The barbed poetic indictment by a rural clergyman, in 1784,

> Thus calico and silk and sin,
> By slow degrees kept coming in—

found staunch support among farmers of the older generation; to which their wives subscribed—with reservations.

Whatever might be the degree to which the "more genteel" rural people in southeastern Pennsylvania adopted city fashions, the utmost simplicity of dress still prevailed west of the Susquehanna. In pioneer days men wore hunting shirts of dressed deer skin which reached nearly to their knees. These had large sleeves and were so loose that they over-lapped a foot or more when belted; a wallet of bread and meat and other essentials for a woodsman and traveler could be carried in the bosom of the shirt or in its capacious side pockets. Often a handsomely fringed cape was thrown over the hunting jacket. Frontier men wore breeches and leggins of buckskin and fur hats, commonly beaver or coon in winter and oatstraw in summer. Their feet were encased in moccasins made of untanned deer skin or a single piece of leather. These were quickly and easily made but had to be mended frequently.

For wear on dress occasions a few of the more prosperous frontiersmen had swallow-tail coats of blue broadcloth with brass buttons; and if very grand, a stove-pipe hat and corduroy pants. "So great was the destitution of comfortable clothing," says Samuel Wilkeson, "that when the first Court of Common Pleas was held at Catfish, now Washington County, Pennsylvania, a highly respectable citizen could not attend Court without first borrowing a pair of leather breeches from an equally respectable neighbor when he was summoned on a grand jury. The latter lent them and, having no other, had to stay at home." [33]

When sheep were more numerous and flax was grown more commonly, garments for both men and women were made of these materials. Men wore wamuses of wool or linsey-woolsey and trousers of buckskin, jean, blue drilling, tow or corduroy. Women wore short gowns and petticoats of wool in winter and linsey-woolsey in summer. A few had silk dresses which were worn only on special occasions; such favored women enjoyed social distinction in the neighborhood. Farm women commonly went barefooted in summer; in winter they wore moccasins or shoe-packs of calf skin. They wore woolen hats or quilted hoods in winter and sun-bonnets in summer; married women wore "day-caps" and "night-caps". The dresses, petticoats and bed-gowns of the women and the best clothes of the men were displayed on wooden pegs around the walls of their cabins, as evidence of the wealth of the family.

William Hanna describes how pioneer farm women of Greene County made winter clothing for their families: "A man who had twenty-five acres of cleared land was expected to keep ten or twelve long-wooled, coarse, 'mottle-faced' sheep that would shear about three pounds of wool each . . . After it was washed came the wool-picking, a neighborhood social gathering of women, to remove the burrs and dirt. It was then carded with hand cards, later with carding machines driven by water power or a tramp wheel. The rolls were then taken home and the music of the 'big wheel' began. The yarn was colored with white walnut bark, making an ugly butternut brown color. A few people could afford to buy a few ounces of indigo and a small quantity of madder and thus make red and blue cross-barred flannel . . . But it often happened that there was not enough wool to make two garments for each of the family; consequently it was supplemented by a quantity of cotton yarn for a chain and then the goods was called linsey, the filling being wool." [34]

When calico reached the frontier, about 1770, a woman who could purchase enough for a dress at $1.00 a yard could assume queenly airs.

Until long after 1840 farmers relied upon well-greased leather boots to protect their feet from rain, snow and mud. Charles Goodyear patented a rubber vulcanizing process in 1844 but not until after 1865 did farmers begin, cautiously, to wear "gums".

XVII

FAMILY LIFE

THE PIONEER rural family was held together by practically indissoluble bonds, religious and economic. Marriage was for life, not for temporary convenience. Divorce was rare and separation infrequent. The primary reason for this constancy was religious conviction of the sanctity of the marriage vow. Another factor was the necessity for united effort to provide shelter, food and clothing for the family; any personal dissatisfactions between husband and wife had to be subordinated to this paramount obligation.

Family Ties

The subservient status of the wife tended strongly to prevent homes from breaking up. Women were under the ancient common law of England. In the eyes of this law, husband and wife were one person; the wife had no legal separate existence. Legally she was little better than a slave. Marriage gave her husband title to all her property, real and personal; but he also became liable for her debts and contracts. He had the legal right to whip her if he thought she needed discipline. Rarely did a wife desert the "bed and board" of her lord and master even though the provocation might be great; she would be a social as well as a legal outcast. There were few opportunities for a woman to earn a living except as wife and mother. If her husband preceded her to the grave, remarriage usually was an economic necessity.

Under the stern and demanding conditions prevailing in a new country there was a marked preponderance of men, hence all women of childbearing age, even those of dubious pulchritude, could secure a husband. "Here all young men and women that wants wives or husbands can be supplied," wrote a young farmer in 1725.[1] Young folks married early, boys at eighteen to twenty-one, girls at fourteen to sixteen. Life expectancy was much lower than at present, especially for women. They bloomed early but withered quickly under the hardships of pioneer life and the strain of bearing an almost continuous succession of children.

A girl began to prepare for marriage while yet a child. She spun and wove linen and wool under the watchful eye of her mother and made blankets, sheets and other necessary articles for the prospective household. Every girl who was carefully brought up made a "sampler" with colored silk thread on linen cloth. This served the double purpose of teaching her letters and numerals and how to make various stitches. She made patchwork quilts in intricate design and sewed into them dreams of her bridegroom-to-be.

Meanwhile her parents accumulated as much of a dowry as their slender means afforded; feathers to make bed ticks, some linen, a few pieces of pewter, a few chairs. If prosperous, her father was expected to contribute a cow, a horse, a sow and some chickens to help stock the new farm. The most valuable dowry of the bride, however, and that which was most carefully appraised by her enamoured but still realistic swain, was her industry and home training in household arts—spinning, weaving, cooking, milking and the other manifold duties of a pioneer wife.

The main matrimonial assets of a young man were his two hands and a willingness to work. When a German farmer's son was about eighteen years old and able to do a man's work, he began to think about becoming established in a home of his own. His father gave him a horse, bridle and saddle for his courting. During week-days he wore homespun and heavy kip leather brogans, but when he went courting he was resplendent in calf-skin boots and a suit made by the village tailor. When he married, his father gave him a tract of land, a yoke of oxen, a cow, a few farm implements and a small stock of seed, just enough to give him a start on the new farm. A "bee" was held to "roll up" a log house for the newly-weds. So they began their life together, with little but love, faith and industry.

Children came quickly and regularly to pioneer families. The census of 1790 revealed that the average number of children per family in Pennsylvania was six, even though infant mortality was very high. Families of ten to fourteen children were not uncommon. Children were an economic asset—the more there were, the more prosperous the family. Boys were obligated to work for their parents, without pay, until they married or were twenty-one and girls until they were eighteen. They were a major source of labor for the operations of the farm and household.

Time off for schooling was negligible, rarely more than three months a year between the ages of eight and fifteen. As soon as they could toddle, children were put to work. By the time they had reached marriageable age, which was when modern children are still in high school, their labor had repaid many times over the slight expense of their upbringing.

Pioneer farm women, however, paid a fearful price for early marriage and constant child-bearing. Frontier grave-yards were populated with worn-out mothers who were quickly succeeded by youthful step-mothers. Many pioneer farmers were laid to rest beside two or three wives.

FAMILY DUTIES

The colonial farm family was a closely-knit economic unit operated in the patriarchal manner. Each member of the family, even the child who was barely able to walk and talk, was assigned duties. There was a wide variety of activities on the self-sufficing farms of colonial days. Since hired labor was practically non-existent, servants or slaves were few, and there was little money to pay help, most of the work was done by the family. There was some division of labor, based on sex, age and strength, but everybody participated in certain operations, especially at harvest. The earnings of children belonged to parents until they reached legal age, but usually a part, at least, was saved or invested in land so that when the children married they could count on their parents to give them a start in their new life.

In the early days a man was expected to be the primary bread-winner as well as the "head" of the family. He was engaged in the arduous labor of subduing the wilderness, tilling the soil, and caring for livestock. He cleared land, built fences, plowed, harvested, threshed, sheared, butchered, cut firewood, and often was his own blacksmith, carpenter, cabinet maker and shoemaker. When he went hunting or fishing it was more for the practical purpose of supplying the family larder than for sport. Upon him rested the obligation of protecting the family, if need be, from wild animals, marauders and Indians.

It was the duty of the father to train his boys in habits of industry and to impart to them what he knew about farming. As soon as a boy was old enough to venture beyond the watch-care of his mother, he was put at work. With the experienced assistance of "Old Shep" he drove cows to pasture. He carried water or more potent liquid refreshment to men working in the harvest field, hunted eggs in the haymow and fence corners, "rode horse" in cultivating corn, kept the woodbox in the kitchen filled, helped do the "chores" and made himself useful about the farm in many other ways.

During long winter evenings boys were expected to shell corn by scraping the ears over the edge of a shovel or frying pan. The cobs were used as lightwood and their smoke was thought to impart a special flavor to hams and bacons. As youths, they fed livestock, cleaned out the stables, split firewood, held the plow, cut a swath of grass behind their father, raked hay, tramped it down under the eaves, hetched flax, took an end of a cross-cut saw, and began to enter upon man's estate in responsibility. When they were eighteen and "man-grown" they led the harvest hands, and rode the best colt to go "a courtin' ".

To the woman fell the even more arduous and exhausting labor of the household. She cooked the daily meals—all hearty—carded, spun and wove wool and flax, ground corn, made clothes for all the family, made candles and soft soap, made garden, milked, made butter and cheese, gathered and preserved or dried fruits, nuts and medicinal herbs, carried water from the spring, bore numerous children and reared them. Her life was a round of drudgery and often of loneliness. Like the good woman of the Scriptures, she was a "crown unto her husband"; she "looked well to the ways of her household and ate not the bread of idleness."

Woman's work varied somewhat with the nationality of the settlers and the times. "Woman's work in New Sweden," says A. Johnson, "was to look after the garden and the cattle, to spin and to weave both the linen and the wool with which to clothe the people, to keep the nets and seines in order, to make malt, to brew the ale, to bake, to cook the food, to milk the cows, to make cheese and butter." [2]

The manifold duties of a rural housewife of a century and a half ago are indicated in an advertisement for a housekeeper which appeared in *Pennsylvania Packet* in 1780: "Wanted at a Seat about half a day's journey from Philadelphia, on which are good improvements and domestics, A single Woman of unsullied Reputation, an affable, cheerful, active and amiable Disposition; cleanly, industrious, perfectly qualified to direct and manage the female concerns of country business, as raising small stock, dairying, marketing, combing, carding, spinning, knitting, sewing, pickling, preserving etc., and occasionally to instruct two young ladies in those Branches of Oeconomy." [3] It was expected that this paragon of virtue and efficiency could be secured for $3.00 a week and found!

It was the duty of a mother to teach her daughters all the domestic arts by the laboratory method—learning by doing—so that when eligible young men of the neighborhood began to look around for helpmeets, her daughters would find favor in their eyes because of their industry and skill as well as their personal charm. Boys and girls were taught, and compelled if need be, to respect their elders and to work. The training of children was almost wholly in the home; public training, in public school and Sunday School, had hardly begun.

Immediately after the supper dishes had been washed and the little children put to bed, evening tasks began. As told by Plumb: "The blazing wood fires made everything look cheerful about the home in the long winter evenings. Bed-time for children was at eight o'clock and at nine the whole family retired and the stranger within the gates. Until bed-time all were employed, the women carding wool or spinning tow or flax or some other occupation. The men and boys would be shelling corn or making splint baskets or chairs, or twisting tobacco to press into plug, or making rakes or flails or some other useful thing. All were employed—none was idle."[4]

After-supper hours also were utilized by men and boys to fashion wooden household and farm utensils with jack-knife and draw-knife—dishes, spoons, splint brooms, churn dashers, cheese hoops, ax helves, ox-bows, scythe sneths, saddletrees and other necessities. They also split out staves and shingles.

THE AGE OF HOMESPUN

Until about 1820 linens, woolens and other fabrics were manufactured not in factories but in homes, mainly farm homes. Domestic manufactures were an important supplemental source of income of farm families. The housewife bartered such of her fabrics as were not needed for family clothing and household use for goods at the country store or for the wares of the tin peddler.

In 1673 the wives and daughters of Swedish settlers on the Delaware "employed themselves in spinning wool and flax and many in weaving." One of the first branches of industry to be encouraged by William Penn, by means of public fairs, was the home manufacture of linens and woolens. Until about 1820 linen served all the purposes for which cotton now is used; flax was grown on nearly every farm. So great is the power of custom that even today family cotton goods still are called "linen".

By 1750 Pennsylvania farm women were making practically all the linen and woolen clothes worn by their families and often had a substantial surplus to sell. "From every farm home," says a contemporary, "came the hum of the spinning wheel and the clack of the loom—these were the only instruments of music then heard." Scotch-Irish and German housewives were particularly skillful in domestic manufactures.

Spinning was the almost universal employment of farm women; to this day the legal title of an unmarried woman is "spinster". Flax and wool were the chief raw materials of domestic manufactures; a few coarse fabrics were made from hemp and, for a time, a little cloth was made from silk produced by home-reared silk worms.

The many operations in the preparation of flax for spinning—retting, breaking, swingling, scutching, hackling—were done by men, who also sheared and washed wool. Carding wool, spinning, weaving, bleaching and dyeing were women's work. Washed wool was combed as nearly straight as possible with two handmade cards having leather backs and wire teeth. It was detached from the cards as a long, fleecy roll ready to be spun into yarn. Wool was carded by grandmothers whose strength and eyesight were not equal to more exacting work. In later years it was bundled into an old sheet and sent to the neighborhood waterpower fulling mill, where it was put through the carding machine. It came back to the farm in rolls about thirty inches long and half an inch thick, ready for spinning. By 1810 there was a carding machine in nearly every community.

A good day's spinning for an adult was six skeins; these required steps equivalent to walking twenty miles. Sometimes the work was lightened by having spinning parties. Women often carried a small wheel to the home of a neighbor for an afternoon of spinning and gossip. Spinning flax and wool into thread or yarn was required training for all farm girls, beginning when they were five or six years old. A girl who prepared for the greatest event of her life by adding to the store of linen in her hope chest was likely to be sought by thrifty suitors. A spinning wheel always was included in her dowry.

Both government and private enterprise sought to encourage spinning. Pastorious, founder of Germantown, included a spinning wheel on the seal of the town. In *Pennsylvania Pilgrim* Whittier noted:

> Still on the town-seal his device is found,
> Grapes, flax and thread-spool on a three-foil ground.

Spinning matches were popular. About 1754 premiums were offered in Philadelphia for "the most efficient spinsters". During and immediately following the Revolution it was considered to be the patriotic duty of all women to spin; the war had cut off supplies of clothing from abroad and forced the colonists to manufacture homespun in much greater quantity. Benjamin Franklin voiced the general condemnation of idle women in his *Poor Richard's Almanac:*

> Many estates are spent in the getting
> Since women for tea forsook spinning and knitting.

Most pioneering farm girls were taught to weave as well as to spin. Weaving, however, was not woman's work exclusively; nearly every rural village had one or more men weavers who worked at their homes for so much a yard or for a percentage of the finished product. Some carried their looms from house to house. Little girls were provided with small "braid" or "tape" looms; these could be taken out of doors and used to make braids, tapes, garters, stay-laces, belts and "galluses" while they watched cattle or sheep at pasture; or they could be carried to a neighbor's home for an afternoon of "neighboring".

Hand looms used by early settlers were essentially like those that had been used in the Old World for many centuries. They were made by local craftsmen. Being much larger than spinning wheels they often were placed in a shed-room or attic, sometimes in a separate loom-room. Weaving required many operations; in a day's work the shuttle might be thrown, the treadles pressed down and the batten swung more than 3,000 times.

After the homespun cloth was woven it had to be carefully fulled. At first this was done with the heads of fuller's teasels gathered in the fields; these teased up or roughened the surface or nap. After 1800 teasels were succeeded by fulling mills.

After cloth was fulled it was bleached. Thirty to forty manipulations were required to bleach the natural brown color of linen cloth to pure white. "Each farmer in the Wyoming Valley," says Plumb, "had a plot of grass sod of an acre or so, lying near a spring or brook, where he retted his flax and bleached the cloth. Such plots were almost constantly covered with bleaching cloth except in winter. Linen cloth was bleached by sprinkling it every day with water and letting it lie in the sun." [5]

All the dyes used in early days except indigo were garnered from the woods and fields; red from madder; yellow and brown from the bark of butternut, red oak and hickory; crimson from the juice of pokeberry boiled with alum; green from a decoction of goldenrod flowers mixed with indigo and alum; yellow and orange from sassafras bark. These home-made colors were far from being "fast," and they often "ran". It was disastrous for a fine young gentleman of the city who was inordinately proud of his brightly colored garments to be caught out in the rain. The most popular color was deep blue; this was secured from indigo, which was purchased from a tin peddler or from the country store.

The most common farm-made fabric of early settlers was linsey-woolsey, which had a linen warp and a woolen woof. Serges, kerseys and druggets also were made of wool variously combined with flax or tow. Coverlets woven on hand looms more than a century ago, in many intricate and beautiful designs, are among the most treasured family heirlooms of the present generation. The quality of homespun has been charmingly described by Alice Morse Earle:

"The home-spun linens that were thus spun and woven and bleached were one of the most beautiful expressions of old-time home life. Firm, close-woven and pure, their designs were not greatly varied nor was their woof as symmetrical and perfect as modern machine-made linens, but thus were the lives of those who made them—firm and close-woven in neighborly kindness. . . . Their days had little variety and life was not altogether easy; like the web they wove, it was sometimes narrow. I am always touched when handling these homespun linens with a consciousness of nearness to the makers; with a sense of the energy and strength of those enduring women who were so full of vitality and unceasing action." [6]

The same discerning author paints a picture of homespun activity on the farm:

"The wool industry easily furnished home occupation to an entire family. Often, by the bright firelight in the early evening, every member of the household might be seen at work on the various stages of wool manufacture. The old grandmother, seated next to the fire, is carding the wool into fleecy rolls. The mother, stepping as lightly as one of her girls, spins the rolls into woolen yarn on the great wheel. The oldest daughter sits at the clock reel, whose continuous buzz and occasional click mingle with the rise and fall of the wool-wheel and the irritating scratch, scratch of the cards. A little girl at a small wheel is filling quills with woolen yarn for the loom; the irregular sound shows her intermittent industry. The father is setting fresh teeth in a wool card and the boys are whittling hand-reels and loom-spools." [7]

In 1810 what seems to be an amazingly high average production of homespun in Pennsylvania per farm was forty-four yards. In 1815 Tench Coxe reported that 997,346 yards of woolen cloth were produced in Pennsylvania homes and only 30,666 yards in factories.[8]

Homespun was bartered at the country store for salt, sugar, spices, tea and coffee or was exchanged for the wares of the tin peddler. When homespun linen could be sold for thirty to forty cents a yard, the farmer and his boys were likely to wear shirts and trousers made of tow—cheap but very scratchy until after many washings. Knitting, also, was an important branch of domestic manufactures; it produced hosiery, mittens, shawls and comforters, for sale as well as for family use. When a girl was five years old and could hold the needles, she was taught to knit.

In 1791, when homespun was at the height of its popularity, Alexander Hamilton, Secretary of the Treasury, complacently surveyed "a vast scene of household manufacturing". He computed that "two thirds, three fourths and even four fifths of all the clothing of the inhabitants are made by themselves." In 1811 Albert Gallatin, then Secretary of the Treasury, estimated that every person in the Union averaged $6.00 worth of clothes, practically all of which was homespun.

Domestic manufactures were strongly supported by political and civic leaders; they believed that home industries had a profound influence on the character of the people because they centered the activities of the family in the home. In 1821 Deborah Norris Logan, wife of the distinguished Dr. George Logan of "Stenton," Philadelphia, said, "He [Dr. Logan] wished manufactures to be encouraged such as the farmer sees carried on in the bosom of his own family by the industry of his wife and daughters . . . untarnished by the profligacy of manners which too frequently attends collecting people to work in large manufacturing establishments." [9]

The transfer of the textile industry from home to mill was gradual. First step was the establishment of fulling mills operated by water power. Soon carding machines were installed in these mills. In 1797 there was established in Philadelphia "a most curious and extensively useful Manufactory, in which the spinning and weaving of hemp, flax and tow are performed by means of machinery, the whole being carried on a waterwheel and requiring no other labor than that of a few boys."[10] This was the beginning in America of the movement which had revolutionized the textile industry of Great Britain, during the decade 1760-1770, resulting in riots and economic distress among displaced workers.

By 1820 spinning and weaving machinery was beginning to crowd out the home industry. The first textile mills were small, neighborhood enterprises located in rural villages where water power was available, rather than in towns and cities. Many of the workers were farm girls. At first, factories wove yarn that had been spun in homes. By 1830 factory-produced linens, cottons and woolens were driving homespun from the market. Farm production of linens, which was more arduous work than the making of woolens, was abandoned first; cotton goods from New England factories took its place. Flax production, which heretofore had been almost universal on Pennsylvania farms, was discontinued except a small acreage for the production of flax seed. The graceful spinning wheels and cumbersome looms were banished to the attic where they accumulated dust and cobwebs until sought by antique hunters of a later generation.

Domestic manufactures for family use continued in the mountainous areas of central and western Pennsylvania for a few years longer, and among Germans; but by 1840 what Horace Bushnell called "mother and daughter power" had given way almost completely to water and steam power. Country people abandoned homespun for "boughten" clothes, which were cheaper and better looking but far less durable.

The passing of homespun worked a domestic and economic revolution. This has been well stated by P. W. Bidwell: "It harnessed together in the productive process all the members of the family, young and old, male and female. It concentrated attention upon the interests of the *family,* as a group, rather than upon the interests of its individual members." Close-knit family life on the farm reached its zenith in the "Age of Homespun."

SICKNESS

In 1698 Gabriel Thomas asserted, "Of Lawyers and Physicians I shall say nothing, because this Country is very Peaceable and Healthy; long may it so continue, and never have occasion for the Tongue of the one or the Pen of the other, both equally destructive to men's estates and Lives."[11] This appraisal was not verified by later developments; both lawyers and physicians found abundant opportunity to practice their skills, the one in adjusting disputes on land titles, the other in ministering to people afflicted by a multitude of diseases.

The new and sparsely settled country was not, in fact, very "healthy." Abysmal ignorance of the causes of disease, limited means of medication and almost complete disregard of the laws of sanitation, especially drainage and disinfection, made the settlers an easy prey to sickness. Life expectancy was low; infant mortality was appallingly high.

Sickness and death were the subject of conversation to a degree that would be considered morbid today. The prominence accorded to death made funerals public events and social functions of the first order. Great crowds attended them. The expense of extravagant funeral feasts was a millstone about the necks of sorrowing relatives for many months thereafter.

Undrained swamps and dense, dank woodlands through which the rays of the sun rarely penetrated made malaria, then called "fever and ague," or "fever and chills," a common and virulent disease. According to Alsick in 1658 the Dutch and Swedes along the Delaware were afflicted with "ardent prevailing fever and other diseases by which the large majority of the inhabitants are oppressed and broken down. . . . Besides that, our barber [surgeon] died." [12] In the following year Alsick reported: "That prevailing violent sickness, which wasted a vast deal of goods and blood from one year to another and which not only raged here but everywhere throughout the province, and which consequently not only retarded our progress in agriculture but threw a damp over the whole undertaking. . . . We will devoutly pray our God and hope that our sins may discontinue and then, of course, the punishment shall be abated." [13]

No one thought of connecting the incidence of malaria with the product of undrained swamps—the myriad of mosquitoes. It was thought to be due to "noxious vapors" arising from decaying vegetation in swamps. The customary treatment was a sweating bath and copious draughts of a decoction of snakeroot; quinine was not known.

Many settlers were cold and wet much of the time, hence rheumatism and pneumonia were quite common. Small pox, yellow fever, typhoid fever and measles were the most virulent contagious diseases. In the absence of vaccination, small pox was terribly destructive. The first epidemic swept the state in 1777. The yellow fever epidemic of 1763 was particularly mortal along the Juniata River. Typhoid fever, then called "bilious fever," took heavy toll. Tuberculosis, at first called a "decline," later "consumption," carried off many promising young men and maidens.

In the early colonial days of Pennsylvania the physicians were held in low esteem, mainly because they gave little effective service. When Governor Johan Printz arrived at New Sweden in 1643, he was accompanied by a surgeon, then called a "barber." Three barbers accompanied

William Penn on the *Welcome*. The chief function of a barber, aside from cutting hair, was to let blood, hence the blood-red and white (representing bandages) on modern barber poles. Eventually the barber became less a surgeon and more a hairdresser; then physicians, as specialists, came into vogue.

For many years blood-letting was thought to be the sovereign remedy for a multitude of human ills. Physicians were called "leeches," after their chief stock in trade. One of the earliest physicians of Pennsylvania was Dr. Christopher Witt, who was located at Germantown from 1704 to 1765. He was an astronomer as well as a physician; possibly he considered that he was aided in diagnosis and prescription by stellar influences.

Many rural physicians of colonial Pennsylvania were quacks with little or no professional training; except for surgical cases, it was safer to let nature take her course. Most of them had no formal medical training whatever but were apprenticed to a practicing physician for four or five years.

Until after 1750 the standard medical practices were bleeding, purging and vomiting. Whenever a "leech" was not sure what the trouble was, he drew a pint of blood; if quite sure of his diagnosis, he drew blood anyhow. Bleeding was practiced in the treatment of such widely different ailments as fevers, pneumonia, sunstroke, epilepsy and tuberculosis, and was routine for about every other disease. Bleeding was performed by the application of leeches (bloodsuckers) or by an incision with a scalpel or lance. It may have been beneficial in some cases, by removing toxic blood, but was applied far too generally. The practice fell into disrepute after 1840.

With the gradual advance of medical science, much improved methods, and higher standards in the training of physicians, their professional status was enhanced. In many cases the country doctor rivaled the minister as a leader in rural communities, especially in sparsely settled areas. Many of them performed heroic service in the best traditions of their profession. They ministered to the afflicted for many miles around. They beat their way through snow-drifts and forded swollen creeks, frequently at the risk of their lives. One of them in northwestern Pennsylvania tells of the obligations of his calling:

"When I commenced the practice of medicine I had to ride on horseback. My field extended all through and over Jefferson, Forest, Elk and the western part of Clearfield counties. I have traveled a circuit of one hundred miles in my day. My rides were long, day and night, through rain, mud, sleet, snow. . . . I have traveled creek beds, swam my horse across rivers when they were in rafting stage, ridden from dark to daylight all alone through the wilderness. . . . In those days there were no telegraph, telephone or daily mail through which to summon a doctor, but a neighbor had to be sent on foot or horseback. . . . Remedies were crude and drastic; instruments few, imperfect and clumsy; yet I tied arteries, set broken bones, amputated limbs, saved lives. . . .

"The pioneer doctor carried his pill bags well stocked with calomel, Dover's powder, tarter emetic, blistering salve, a pair of old turnkeys for extracting teeth, and spring-and-thumb lancets for bleeding purposes, as everybody had to be bled, sick or well. . . . My partner made what he called 'Devil's Broth'—a mixed decoction of about all of our roots and herbs, to be administered, as he said, with the hope that some of the ingredients would hit the disease. A town visit was from twenty-five to fifty cents; a visit in the country twenty-five cents a mile; an obstetric fee five dollars." [14]

In remote settlements in the wilderness where no doctor was available, farm families had to depend upon themselves and their neighbors. They may have had a well-thumbed copy of John Tennant's *Every Man His Own Doctor*, written, he says, "for those who cannot afford to dye at the Hand of a Doctor." In 1736 Benjamin Franklin printed a fourth edition of this repository of surmise and superstition.

Every farm home had a stock of "remedies," the alleged efficiency of which had come down by word of mouth for many generations. Under the ancient "Doctrine of Signatures," it was believed that God has placed a sign or signature on every plant to indicate what human ill it will cure; all that is necessary is to observe its form and color. Roots and herbs that resemble a certain organ of the body were considered to be divinely appointed remedies for diseases of that organ. Thus *Hepatica,* was "liver-wort," from its liver-shaped leaves. Every family had an herb-garden; these were gathered in season and hung in the attic to dry. When sickness entered the home they were brewed into bitter doses and administered copiously to the hapless patient. If he survived, this was proof of their efficiency; if he died, the treatment had been begun too late.

Plumb recalls early medical practice in the Wyoming Valley:

"Physicians were far apart in new settlements; often none were available. What, then, was to be done in case of sickness? In such cases the 'old woman doctors' were called in. In those days everyone, especially the women, was more or less informed as to the supposed medicinal value of certain roots, herbs, plants, shrubs and barks, all to be found in their gardens or in the neighboring woods. Every garden—and they prided themselves on their gardens—was provided with hops, sage, rue, wormwood, tansy, peppermint, spearmint, catnip, thyme, horehound, camomile, mustard, rhubarb, yellow dock, comfrey, opodeldock, dill, colt's foot and many others, equally good and equally nauseous. They were very liberally administered, together with hot baths, sweats, salves and poultices." [15]

It was believed, moreover, that nearly every native plant had a specific medicinal value. Much of this lore had been derived from the Indians. Thus motherwort was efficacious at childbirth; catnip tea relieved colic; burdock leaves reduced fever; blackberry juice cured dysentery; pokeberry juice was effective against cancer; Jamestown weed ("jimson weed") relieved asthma; a poultice of everlasting reduced swellings of the head; cinquefoil cooled fevers; a decoction of the flowers and roots of sassafras "purified the blood"; applications of grapevine sap made hair grow on bald heads; the inner bark of young black cherry trees was a spring tonic; elderberries were an excellent purge; pennyroyal tea induced sweats in fever cases; sweet fern and goldenrod tea were efficacious for bowel trouble; the roots of the bayberry bush relieved toothache; cedar berries strengthened a weak spine; boneset tea cured ague and consumption; white walnut bark was a prime purgative; and so on.

Every farm woman was a "practical nurse." She administered calomel to her husband to cleanse his liver, sometimes in doses large enough to loosen his teeth. She purged him with senna or rhubarb. Every spring she "purified the blood" of her children with sulphur and molasses, or with a decoction of sassafras roots, winter-green, white pine tips, pennyroyal and other potent herbs. Each spring she forced great draughts of "bitters" down their reluctant throats. In the absence of a leech she bled them. The almanac gave explicit and infallible directions for administering kitchen physic. Far more children were brought into the world by midwives—motherly old women of the neighborhood—than by doctors.

Many old-time remedies of kitchen physic were fantastically heroic. Such, for example, was the treatment for bruises prescribed in William Penn's *Book of Phisick:* Six pounds of butter, a bottle of black snails, rosemary, lavender, elder and "new Cow-dung as much as will go into a great oyster-shell, and half as much new hen-dung." [16] Until after 1840 many country school children wore medical amulets as protection against sickness. These were a mixture of sulphur, camphor and asafetida enclosed in a small bag and hung around the neck; the stench was enough to keep people away if not germs. "Nanny tea" was drunk to excite perspiration and bring out the rash in measles and other eruptive diseases; it was made from sheep dung. "Elixir of earth worms" was a sovereign remedy for many ills. Toothache might be prevented by using a toothpick made of the middle toe of an owl. A sure cure for epilepsy was to wedge apart the forks of a young crooked tree and pass the patient through the aperture three times, then remove the wedge; if the two forks grew together again recovery was assured.

Aching teeth were extracted with turnkeys or with a "pullikens"; either left the sufferer a nervous wreck. According to H. Hollister, an even more heroic method of tooth extraction was practiced by pioneers in the Wyoming Valley. This was "shooting it out." "One end of a strong hempen string was tied to the aching tooth and the other end to a notched bullet, which was placed in the barrel of a flint-lock musket loaded with an extra charge of powder. When all was ready the desperate man caught hold of the gun and pulled the trigger. Out flew the tooth from the bleeding jaw and away bounded the musket several feet."[17]

The most dreaded contagious disease was smallpox; it carried away thousands and permanently disfigured many more. In 1701 Logan noted, "The smallpox was very mortal and general." The epidemic of 1730 was particularly devastating. Vaccination, or "inoculation" was first practiced in Pennsylvania in 1731, over the burning protests of many religious leaders. In 1722 one minister called vaccination "an unjustifiable art, an infliction of an evil, and a distrust of God's ever-ruling care."[18] Another, with misguided fatalism, trumpeted from the pulpit, "We, who are only tenants, have no right to pull down the house that belongs only to the landlord who built it." Following this line of reasoning, many people thought vaccination sacrilegious and refused to give their children this protection. Not until long after 1800 was it generally accepted.

The era of patent medicines began in rural Pennsylvania about 1810, when newspapers and almanacs were more widely read and tin peddlers had begun to carry their assortment of wares, including quack remedies, to remote farm homes. Patent medicines were even less effective than kitchen physic and much more expensive. Nearly every farm had a medicine chest in which were stored "chymical and galenical medicines" of distinction, including such boons to suffering humanity as "Ward's Anodyme Pearls," which were to be worn by teething children; "Stoughton and Duffy's Elixir"; "Boerhaven's Chymical Tincture"; "Turlington's Original Balsam of Life"; "Bateman's Drops"; "Hill's Balsam of Honey"; "Golden Spirit of Scurvey Grass"; "Swinson's Electuary"; "Dr. Robertson's Celebrated Stomachic Elixir of Health," and many other nostrums. Most of them were advertised as infallible cures for a great variety of ills and practically all were worthless.

The first patent medicine was "Tuscarora Rice," a preparation of Indian corn introduced by Mrs. Sybilla Masters of Philadelphia in 1711. She claimed that it would cure tuberculosis, epilepsy, fever and ague and a host of lesser ills. The stand-bys in most farm medicine cabinets, however, were calomel, ipecac, camphor and boneset.

Quack doctors of every description and poorly trained physicians of early colonial days reflected unfavorable economic conditions in the profession. Adequate training could be secured in England and Scotland but only at great expense. People were accustomed to rely on home remedies and resorted to a physician only for surgery or difficult cases of child-birth. The compensation was low. The first medical school in the United States, the College of Physicians and Surgeons in Philadelphia, was established in 1787 and the first dispensary in 1786. These advances were mainly the fruits of the labors of Dr. John Morgan, Dr. William Shippen and Dr. Benjamin Rush of Philadelphia, all of whom were trained abroad.

As competent physicians and drug stores increased, the use of home remedies declined. After 1800 midwifery was mostly transferred from old women to professional men; previously it had been considered indelicate for a man to be present at childbirth.

Notwithstanding the drastic remedial treatment to which they were subjected when sick, most farm men lived to a ripe old age because of vigorous constitutions developed by out-of-door lives and freedom from the nervous strain of fast-pace civilization. Farm women were not so fortunate; early and continuous child-bearing sapped their vitality and sent them prematurely to the church-yard or to the family burying-ground on the farm.

FARM HOME SCENES

Home life reflects the character and ideals of the home-makers. The early settlers were, for the most part, devout Christians; most of the special occasions observed in the home were of religious significance.

From the very earliest beginning of the colony the birthday of Christ was observed in homes as a religious festival. Amandus Johnson pictures Christmas in the homes of Swedish and Finnish settlers about 1654:

"The floors of the dwellings were covered with straw, in some cases with finely cut spruce branches. . . . Outside of some doors was a large cross made of straw; a cross might also be seen on barrels and other vessels, painted there before the Christmas holiday. . . . There was happiness everywhere. Long preparations had been made, special bread had been baked, special beer had been brewed, and the best that the home could afford was brought forth. Candles were lit, especially two large ones made for Christmas Eve, and the clothes and silver of the house (if there was any) were brought in for the candles to shine on—it produced good luck. . . . Everybody was greeted with "Happy Christmas" and the old northern practice of giving presents was not forgotten. . . .

"Early on Christmas morning, about five o'clock, the settlers assembled in church on Tinicum Island, listened to two services which lasted four hours or longer, and then returned to their homes. The day was spent in quietness. The next day, called the Second-Day-Christmas, was passed in going to church and in visiting neighbors."[19]

Christmas trees were not used in Pennsylvania until about 1730 and were not common, except among Germans, until after 1800. The fir-tree decorated with candles had been an emblem of Christmas in Germany since the fifteenth century. Not until after 1840 did "Santa Claus" and his reindeer take full possession of the imagination and hearts of children.

Germans emphasized the family as well as the religious significance of Christmas. On Christmas Eve the "Belsnickel Man," a fictitious character of German origin, was said to appear on earth to reprove boys and girls who had been naughty. "Kris Kringle" brought happiness to good boys and girls by filling their stockings, which were hung by the fireplace, with maple sugar cakes, sugar cookies and a few toys, mostly homemade—perhaps a rag doll for the little girl. Several neighbors might observe Christmas together; one of the men dressed in bear or panther skins to represent the Belsnickel Man, and another, in more radiant garb and jovial mood, as Kris Kringle.

The Scotch-Irish did not observe Christmas to any extent but the English made it a family festival. Men and boys went hunting the day before and usually were able to provide a wild turkey for the feast. On Christmas Eve they read or told the Christmas story and helped the children hang up their stockings. Many of the New England English who settled the Wyoming Valley did not, at first, observe Christmas New Year or Easter, since these were fete days of the ecclesiastica organization that had persecuted them in England.

Throughout our colonial days most families observed, gladly, the biblical injunction, "Given to hospitality." Homes, even the most humble, were open to neighbors and wayfaring strangers at all times; the latch string was out. In sparsely settled districts where there were no inns the stranger was welcomed and provided food and a bed, even though it might be only a place to spread his blanket before the fireplace. This was not merely the performance of a duty; the family wa hungry for the sight of new faces and for news from the world beyond their narrow horizon. The experience of Gottlieb Mittelberger abou 1750 is representative of the open-handed hospitality of farm homes a that time:

"In Pennsylvania one might travel about a year without spending penny; for it is customary in this country that when one comes wit his horse to a house, the traveller is asked if he wishes to have somethin to eat, whereupon the stranger is given a piece of cold meat which ha been left over from dinner; in addition to this he is provided with fin bread, butter and cheese, also with plenty to drink. If one wishes t stay over night, he and his horse are harbored free of charge. If on comes to a house at meal time he is asked to take his seat at the table and to take pot-luck." [20]

The hospitality of even the most primitive log cabin was extended to the stranger as freely, and was accepted as gratefully, as that of more prosperous farm homes in the older settlements. Witness this account by Andrew Burnaby:

"Being fatigued he presently desired them to show him where he was to sleep; accordingly they pointed to a bed in a corner of the room where they were sitting. The gentleman was a little embarrassed, but being excessively weary he retired, half undressed himself and got into bed. After some time the old gentlewoman came to bed to him, after her the old gentleman and last of all the young lady. This, in a country excluded from all civilized society, could only proceed from simplicity and innocence." [21]

The solidarity of the colonial farm home centered around the fireplace. This has been pictured by Henry W. Ashmead:

"At night, after the evening meal, the family assembled around the big fireplace in the kitchen. On the hearth, the andirons sustained a crackling mass of hickory wood. Along the heavy, unplastered joist of the floor above, darkened with age and smoke, dried beef, hams, ropes of onions and dried apples hung. On the table a tallow candle shed a dim, uncertain light. In one corner of the room stood a large corner cupboard, with an array of blue china. An eight-day clock in a tall mahogany case ticked ponderously in the chilly hall; while the moon, moving along an opening in the dial, told the farmer when and when not to plant his crops. Around the cheery fire the family sat on hard, uncushioned chairs, the females spinning or knitting, the men smoking, talking of weather, crops, the market, one another's stock or laying out the next day's work."

To complete this pen picture—the children sat on the floor before the fire, cracking walnuts and hickory nuts and hunting for the "goodies"; or eyeing hungrily the row of red-cheeked apples simmering on the hearth. The watch dog curled close to the fire and dozed. At nine oclock the children climbed the ladder to their beds in the loft. After the mother had set her dough to rise and the father had banked the fire they repaired to their bed in the corner of the one-room cabin. It was the end of another day of "pleasant bread".

XVIII

Stirring apple butter.

SOCIAL CUSTOMS IN THE HOME

UNTIL after 1840 Pennsylvania farm homes were comparatively isolated. Settlements were much less compact than in New England and less likely to develop strong community life. Most rural communities were mere hamlets, consisting of a store, a tavern, one or two churches, a blacksmith shop and a few homes; practically all the population lived on widely scattered farms. "It was a very rare but pleasing thing," wrote one of the early settlers, "to hear a neighbor's cock crow."

The day's work was from sunrise to sunset, with chores to do before daybreak and after sunset. There were few holidays. Many farmers and their wives came to the end of their earthly pilgrimage without having been more than a few miles from home. About once a week they rode or drove to the village to trade at the country store, to get mail, to shoe a horse, to take grist to the mill or to go to church. They knew little of life beyond the hills that encircled their quiet valley. There were few newspapers, few public meetings and irregular preaching.

The racial clannishness of the three major national groups limited their interests and their contacts. For more than a century these civilizations tended to maintain themselves as separate units; there was little blending. This was particularly true of Germans. "In this country," said James Mease in 1808, "their originality of language and manners is most generally preserved. In many parts of the state, in German settlements, I have met with adults of the third generation who could not speak English."[1] Thereby they were debarred from liberalizing contact with people of different traditions and points of view.

The German vernacular spoken in homes and used exclusively in their churches and schools was not the traditional literary language of Germany but a dialect which had been modified considerably by the absorption of some English words. This modified German, which even now is the prevalent form of speech among many Pennsylvania Germans, especially in the home, is still in the process of being anglicized.

"NEIGHBORING"

The sternness of pioneer life was relieved at times by neighborliness, fun and frolic. It took more than danger of Indian attack, perils of wild beasts and isolation to quench the gregarious spirit of our forefathers.

Neighborliness was characteristic of rural Pennsylvania in spite of limitations imposed by the clannishness and prejudices of the several ethnic groups. At a time when a farmer had to depend so much on his neighbors for help in time of sickness and at critical periods in farm work, it was incumbent on him to be a good neighbor himself. A man who was not a good neighbor soon found himself ostracized in the community.

Human nature was fully as frail then as it is now, hence quarrels among neighbors, often over very trivial matters, were as frequent and as fruitless then as they are today. According to D. S. Maynard, in the early days of Clinton County a farmer was accused by his neighbor of plucking one of the latter's geese. "This led to a suit at law that continued until each party was obliged to sell his farm and expend the proceeds in feeing lawyers and paying costs. The lawyers had the most profitable geese to pick of any connected with the case." [2]

Neighborliness was expressed through personal friendships with individuals and families and through cooperation in farm and home operations. The latch string always was out to neighbors. Farmers often "swapped work" and there was free exchange of equipment; this was necessary since both hired help and money to pay them or to purchase equipment were scarce.

Visiting was common; the whole family might go to the home of a neighbor after supper and spend the long winter evening in "neighboring." The hostess set before her guests the best that she had, perhaps gingerbread or doughnuts and cider. The elders talked of crops and politics and relayed neighborhood gossip. The children played games before the fireplace. "Sometimes," says a pioneer of Crawford County, "a religious or social party would collect together to spend an evening, not expecting to return to their homes until the morrow. At bed time the women would collect all the bedding and spread it from side to side on the floor. A man and his wife would then take the center and the men and women would range themselves right and left."

FROLICS AND BEES

The most common expression of neighborliness was frolics and bees, in which neighbors assisted one another in necessary work. The word "cooperation" is comparatively modern but the attribute for which it stands is as old as civilization. The labor at frolics (corruption of the German word *frölich*—gay, jolly) and at bees often was arduous but it was done in a spirit of festivity which made the occasions outstanding social events, eagerly awaited and long remembered.

On the Pennsylvania frontier social life for newcomers or newly married couples began with a "raisin' ". The young bridegroom could cut the logs for his cabin home but he could not lay them in place without assistance. When the logs were ready, word of the proposed raising went out through the countryside. Neighbors came from miles around, some on horseback with their wives riding behind on pillions, babes in arms; others in oxcarts, with their entire brood. All welcomed a good excuse to break the monotony of their lives at such a gathering.

A log cabin could be erected in one day. A captain was chosen to supervise operations; usually the same man served at all similar occasions in the neighborhood. The most experienced men were assigned to notch the logs at the corners, others to lift them into place on skids and still others to split logs to make the puncheon floor. The captain would call out, "All together, men, he-o, he! he-o, he!" The logs would rise slowly into place through the combined efforts of a score or more of men. By dinner time the walls were up and ready for the roof.

The noon-day meal provided by the host and hostess was no mere "lunch"; the table was spread with food in great abundance and variety. The hilarity of the occasion was heightened by frequent recourse to the jug, "Brown Betty". After dinner the roof was laid and the crevices between logs chinked and daubed with clay from the "mortar hole." By supper time the cabin was finished except for cutting doors and windows; this was done later by the owner. After supper the older men and their wives might start for home but the young folks stayed for games and dancing, which might last the greater part of the night.

As soon as the beneficiaries of this neighborly visit were well settled in their new home, they were in honor bound to have a "house warming" and invite to it all who had participated in the raising. This was a bounteous supper followed by games and dancing, which lasted until the luster of the morning star was dimmed by the approach of a far greater light.

Raisings continued to be a popular rural diversion long after log cabins had been replaced by frame dwellings. The whole side of a frame house was nailed together on the ground and lifted into place by half a hundred men with long poles. When the ridgepole was put into place the building was christened with a bottle of whiskey. Such a raising required skill as well as strength; accidents were common. Barns and schoolhouses were centers of this type of community cooperation until after 1840.

The social aspects of a barn raising among Germans of Schuylkill County, about 1770, are described by D. C. Henning:

"After the haying season, if a farmer proposes to erect a large barn or other building he digs his foundation excavation and lays the foundation walls late in the fall or early spring, prepares the sills, joists, studding rafters, and places them near the foundation. Then he *I-lauds* (invites) his friends and neighbors to come to the *Curb-blocking* (raising) and with their united strength and labor the whole skeleton is erected.

"Meanwhile the hostess has invited her lady friends to help prepare the feast, especially the young belles, as their beaux are sure to be there to show their athletic feats and their agility. . . . When all is done the fair ones have set a table groaning with the weight of good things. Here will be found Metzel soup, Hamburg sausage, *wurst, sauer kraut,* potatoes, *snitz and knep,* innumerable kinds of pies, cakes, cider and apples, apple butter, *smeer case,* all kinds of jams and jellies, all blended in a mass on the same table. . . .

"The younger fry have laid the threshing floor and have converted it into a dance hall. There the girls and their swains repair and the fun begins, while the older women gossip, wash the dishes and put things to rights, and the older men leisurely smoke their pipes and discuss crops and the wrongs which King George The Third is heaping upon them. . . .

"A circle is now formed on the barn floor and Daphnis and Chloe are the performers. The question at issue is which can dance the other down in a hoedown. Daphnis has husbanded his strength for this feat and finally the graceful Chloe must yield the palm and kiss to him. . . . Then the waltz, the contra-dance, the attempt at the minuet, until supper time. This is soon over and they are at it again until the voice of the chanticleer comes for the third time." [8]

Log-rolling is now a term used to designate a certain type of political activity of doubtful propriety; originally it stood for something fine in rural life. Clearing land of forest was slow work; unaided, a man could hardly hope to clear enough in two years to produce crops sufficient to feed his family. During the winter he felled trees and cut off their limbs. After they had laid on the ground several months and were dry enough to burn he piled the limbs on the trunks and fired them. Large trunks were only partially consumed; charred and blackened butts were scattered over the land. Then it was time to have a log-rolling to "nigger off" the blackened logs.

A score or more of neighbors participated. They came armed with log hooks with which to roll the logs into piles for burning. They worked in teams, each team under a captain. Captains were selected by acclamation and they then chose their teams. The team that piled the most logs was the winner. It was hard, dirty work but, as one participant put it, "the greatest of hilarity prevailed," partly because of frequent visits to a shaded nook where a jug or two of corn liquor was kept to cool parched throats. A "stump-pulling frolic" might follow a log-rolling.

Husking Bees were very popular, particularly among young people of courting age. Joel Barlow's *Hasty Pudding,* written at Philadelphia in the winter of 1792-3, faithfully portrays an old-time husking bee:

> And now, the corn house filled, the harvest home,
> The invited neighbors to the husking come; . . . .
> Where the huge heap lies centered in the hall,
> The lamp suspended from the cheerful wall.
>
> Brown, corn-fed nymphs and strong, hard-handed beaux,
> Alternate ranged, extend in circling rows,
> Assume their seats, the solid mass attack;
> The dry husks rattle and the corn-cobs crack;
> The song, the laugh, alternate notes resound,
> And the sweet cider trips in silence round.
>
> The laws of husking every wight can tell—
> And sure no laws he ever kept so well;
> For each red ear a general kiss he gains,
> With each smut ear she smites the luckless swains;
> But when to some sweet maid a prize is cast,
> Red as her lips and taper as her waist,
> She walks the round and culls one favored beau
> Who leaps the luscious tribute to bestow.

William Hanna tells of husking bees in Green County about 1830:

"I never saw corn cut up and husked in the shock in western Pennsylvania until within the last forty years. Previous to that time the farmer pulled the ears off the stalks, which they left standing in the field. The corn was then hauled to the barn floor and thrown in a long ridge about four feet high. The neighbors were invited in on a moonlight night. Two young men or boys were nominated as captains who requested two, sometimes three, older men to divide the heap for them. . . .

"As fast as the hands alternately selected by the captains were chosen they set in to husking with all their might, each one making as much noise as he possibly could. Whenever one side found themselves sure of victory they picked up their captain on their shoulders and began a most frightful screaming; this was called 'hoisting the captain'. . . .

All hands then proceeded to the house where supper was smoking on the table. This supper consisted principally of chicken pot-pie washed down with an occasional tin of sweet cider; this course was supplemented by several pieces of pumpkin pie."[4]

Old-time husking bees and the host of other frolics were enlivened by singing, stories and repartee. A fiddle or flute guided the chorus in old Jacobite folk songs sung by ancestors of the merry-makers in Scotland, or ancient songs of the Rhineland or "Merry England." Neighborhood raconteurs regaled the group with tales of witches, goblins and murderous pirates which sent chills down the spines of the credulous. Meanwhile the married women prepared the bounteous midnight supper and kept their hands busy at quilting and their tongues equally busy at neighborhood gossip.

After supper the old folks went home but the young folks stayed to dance in the torch-lit barn. The dances were unconventional, rollicking reels and jigs rather than the more sedate cotillions and minuets popular in towns. If no fiddle or flute was available the merry-makers kept time by clapping hands and stamping feet.

Some husking bees and other frolics were out-of-door stag parties, Said Thomas B. McElwee of Bedford County in 1832, "The neighbors met at dark; the corn had been previously pulled and hauled into a pile near the crib. The whiskey bottle goes round, the story, the laugh and the rude songs. Three or four hundred bushels are husked by nine or ten o'clock. A plentiful supper is provided and sometimes the frolic ends with a stag dance; that is, men and boys, without females, dance like mad devils but in good humor to the time of a neighbor's cat-gut and horse-hair." [5]

Butchering, says D. C. Henning, of Schuylkill County, "was one of the greatest fete days of the year for Pennsylvania Germans. It usually occurred late in November. Neighbors of both sexes were invited. They arrived about four o'clock in the morning to find huge log fires already burning and hogs and beef cattle butchered, scalded and hung up. The day was spent cutting up the meat, making sausage, rendering the lard, making scrapple, and smoking the hams and bacons over fires of green hickory chips. . . . At night, after partaking of *schnatz betz* (rye whiskey), all go home carrying with them as much sausage and fresh meat as needed. Often 3,000 to 4,000 pounds of meat are thus prepared for a single family." [6]

The portion of sausage taken home by neighbors who assisted in the butchering was called *metzel-soup*, an anglicized form of *metzel-supple* (to kill and cut up). It was a common practice to send eight to ten pounds of sausage to each intimate friend in the neighborhood and also to poor widows of the community. The ancient German custom of making a fete at butchering is noted in Upland's poem,

Wir haben heut nach altem Branch,
Ein Schweinchen abgeschlachtel.

The butchering frolic of the Scotch-Irish was somewhat different. After breakfast the best marksmen, as determined by a preliminary contest, shot the hogs. The forenoon was spent by the men in dressing and cutting up the carcasses; the afternoon in games, sports and shooting matches. Meanwhile the women were busy making sausage and scrapple, liverwurst, pickling pig's feet and rendering lard. After a generous supper the neighbors went home, each carrying a portion of meat, to get together again soon at another butchering.

Part of the farmer's apple crop was carefully preserved for winter use as dried apples, apple sauce and apple butter. The apple-paring bee was held in the kitchen. Neighbors who came in for a social evening were provided with bushels of apples, empty tubs and pans and sharp paring knives. The apples were pared, cored, cut into thin discs and strung on linen thread, then hung from the kitchen rafters or in the attic to dry.

The apple butter bee or "boiling" was a favorite diversion of courting couples. A large copper kettle filled with sweet cider was hung on the crane in the kitchen or, if the weather was propitious, over an out-of-door fire. When the cider had boiled down sufficiently, pared, cored and quartered apples were added. Young couples took turns stirring the butter constantly with a long wooden paddle. Those not so employed played kissing games in the house or yard. Many a rural courtship was advanced by apple butter bees.

"In one season," says P. E. Gibbons, "we made six barrels of cider into apple butter. Two large copper kettles were hung under the trees in an open fireplace and the cider boiled down the evening before. One hand watched the cider, the others prepared the cut apples, so that in the morning the *schnitz* might be ready. Two and a half bushels of cut apples were required for a barrel of cider. Then stir and stir and stir to prevent burning on the bottom. Some time in the afternoon, when the cider no longer 'weeps out' around the edges, dip it into earthen jars. Evening '*snitzen* parties' to pare apples and make apple butter, were festive occasions. Commonly a boy and a girl both take hold of the long-handle of the stirrer and stir together." [7]

Before homespun was crowded out by the less substantial factory fabrics, spinning bees were a feature of rural social life. It was the pride of the housewife to pit her skill and endurance against that of other women in the neighborhood. Quality of work as well as quantity produced counted in the contest. The objective was to spin the most skeins between sunrise and sun-down. Sometimes sixty or more wheels were in motion. A feast and entertainment accompanied the contest.

Non-competitive spinning parties also were popular. Speaking of conditions about 1770 David C. Henning of Schuylkill County says, "When the flax was broken and hackled, and the wool cleansed and prepared, then came spinning time. . . . The women of the entire neighborhood, to the number of dozens, would assemble in a spinning and weaving party. They would spin and chatter the entire day; by evening there were woolen and linen cloths from which to make garments for summer and winter. When the day was done the beaux would appear and then would come the dance on the barn floor, *bloomsock, booksage,* the owl, etc., until the wee small hours, when the sterner sex would each pick up a spinning wheel, as well as a spinster, and depart for their homes. Sheep shearings and sheep washings all had their concomitant kissing games." [8]

Few farm and home operations which could be done to best advantage through cooperative effort were overlooked by men and women who hungered for fellowship. In the age of homespun, evening "kicking bees" were frequent. Barefooted men sat in a circle on benches. At intervals hot soap suds were poured on pieces of new woolen cloth spread on the floor. The men kicked the cloth vigorously for about three hours to full, soften and shrink it. After an ample supper they went home with miraculously clean feet.

There were "dung frolics" to remove manure that had accumulated for years outside the barn until it almost rendered the building unusable; "lime frolics" to haul quantities of this great soil improver from distant kilns; "quilting parties" and many other diversions. In "breaking-out bees" to open snow-blocked roads, fifteen or more yoke of oxen were hitched to a great snow plow.

Neighborliness and community cooperation were admirable features of rural life. They made isolation much more tolerable.

WEDDINGS AND FUNERALS

In addition to bees and frolics, the social aspects of which were incidental to the accomplishment of necessary work, there were a number of social occasions in the home at which no work was done except by the family, in preparation. Chief of these were marriages and funerals. Customs at these events differed among settlers of different nationalities.

Young folks who came to America married early, boys at eighteen to twenty-one, girls at fourteen to eighteen. According to Gabriel Thomas, in 1697 there were no old maids in Pennsylvania, "for all commonly marry before they are twenty years of age."

Young people of English descent who contemplated matrimony, especially Friends, were required to post an "intimation," or notice of their intention, on the church or meeting-house door thirty days before the event. In a Quaker wedding the bride walked to the meeting-house or rode on a pillion behind her father. After the ceremony the pillion was transferred to the horse of her husband.

Custom made weddings of children of prosperous farmers quite expensive. William Moraley describes marriage among English settlers about 1735: "The marriages are very chargeable, many times the Wife's Fortunes being expended at the Celebration of the Nuptials. Marriage is usually celebrated about noon, generally at the home of the bride's parents. They not only have a sumptious wedding feast at the home but also send out cakes, meats, punch, etc., to everybody in the neighborhood, rich or poor alike, whether close friends or not. In the evening the bride and groom are escorted to their new home by a long procession of gigs or on horseback.

"After supper all dance 'Sir Roger de Coverly' or, as we term it here, Virginia reel, with music by negroes playing by ear only. Occasionally a few who have been to the city go through the mazy movement of the minuet. Games of forfeit are played. About nine o'clock the bride is spirited away by her maids, and shortly after the groomsmen conduct the groom to his bride. At a later hour the company ascend to the bridal chamber taking with them refreshments, mostly liquor. After the bride has been kissed by every man present the assembly disperses." [9]

David C. Henning describes the Pennsylvania German weddings in Schuylkill County about 1770: "Parents would not permit hasty marriages and few marriages take place without the parental consent of both parties. They must court long enough to know each other. Then, too, her parents must know that Hans is *fleisich* (industrious) and not *betrünken;* and his parents must know that Theresa is a good housekeeper—whether she can cook, sew, milk the cows, and whether she is cleanly about her work and loves to work, and that she is not 'high-minded'. After this the parents consult and determine on the 'setting out' that each will give. Wedding presents were almost unknown. . . .

"The banns would then be announced from the pulpit, then the neighbors and friends were *igelauda* (invited) to the house of the bride's parents to witness the ceremony. After a roast dinner in great proportions the barn floor is cleared for the wedding dance, which lasts until cock-crow. In the morning the bride and groom and perhaps the groomsmen and bridesmaids mount their horses and depart on the honeymoon trip. . . . Their home-coming is the *Infare.* When night comes the scene becomes an inferno. Braying mules, tin pans, drum corps and horse fiddles make the air, and the tempers of the bride and groom, furious. Sometimes peace may be purchased with a barrel of cider or its equivalent in spirits." [10]

The "season" for weddings among Old Order or House Amish was from about November first to Christmas, this being the slack time of the year for these thrifty farmers. By 8:30 A.M. the home of the bride's parents was over-flowing with relatives and neighbors. Men and women were segregated. The ceremony, which included lengthy preaching, often lasted three hours. The sumptuous wedding feast which followed required many weeks of preparation. Everybody stayed for supper, also, after which the young folks sang and frolicked until midnight while the old folks sedately discussed crops and church and neighborhood affairs. By ancient custom, a newly married Amishman must be "thrown over the fence" in order to be properly married. This was done by other young men with great enthusiasm.

A frontier wedding of a Scotch-Irish couple in southwestern Pennsylvania about 1763 is described by Joseph Doddridge:

"Marriages were celebrated at the home of the bride. They were looked to by all, old and young, as occasions for frolic and fun, being almost the only means of producing a gathering except where labor was required, such as reaping, log-rolling and house-building. . . . The groom's party started from the home of his father early so as to reach the house of the bride by noon, the intended time of the marriage—for it always was to precede the dinner. . . . The procession march of the groom's party was intended to be in double file where the horse-paths—for they had no roads—would permit. Such paths were occasionally interrupted by fallen trees, and sometimes so done from mischief, and by interlocking grape vines and saplings, to frustrate the company. Sometimes a posse of neighbors would be resting in ambush to fire a *feu de joie* so as to cover the party with smoke and to create surprise and shrieks among the riding ladies and the chivalrous bustle of their partners.

"As the procession neared the house of the bride it would sometimes occur that two young men would start on horseback, full tilt, to win the bottle of whiskey which, it was previously understood, would be hung out for the gain of the first arrival. The bottle gained, the winner returns to the party and first hands it to the groom; and thence it goes on from one to another, giving each a dram, the ladies included.

"For the repast of such a party the table, made of a large slab of timber hewn out with a broad-axe and set on four sticks, was spread with beef, pork, fowls and sometimes deer and bear meat. . . . If knives were scarce the deficiency was made up by using their scalping knives, taken from the belts of their hunting shirts. After dinner dancing commenced and usually lasted until the next morning. The figures were reels or square sets and jigs. None was allowed to get sleep and if the girls got tired they were expected, for want of chairs, to sit upon the knees of the gentlemen.

"At nine or ten o'clock at night some of the young ladies would steal off the bride, usually to a loft above the dancers, going there by a ladder. . . . Some young men, in the mean time, stole off the groom. At a later period refreshments were sent up to them of which 'Black Betty,' so called, was an essential part. . . . Such entertainments sometimes lasted for several days, none giving over until fully fagged down." [11]

Extravagant wedding feasts for all the countryside began to lose favor after the Revolution—they were too costly. The open-handed hospitality in which they had originated was greatly abused. They degenerated into bacchanalian orgies, dreaded by the bride and groom and even more so by the parents of the bride, who had to foot the bill. Sometimes they were plunged into debt for years because of their effort to give their daughter a "suitable" wedding. By 1800 these excesses had largely ceased.

The curious but brutally humiliating so-called "shift wedding," which was evidence of the chattel status of women at that time, prevailed in the early years of the province. As reported by Peter Kalm, "When a man dies and leaves his widow in great poverty, or so she cannot pay all the debts with which she is left, and notwithstanding all that there is a person who is willing to marry her, she must be married in no other habit than her nightgown. By that means she leaves to the creditors of her deceased husband her clothes and everything which they find in the house. . . . As soon as she has married, and she no longer belongs to the deceased husband, she puts on the clothes which the second husband has given her."[12] Sometimes the widow met her intended husband half way between her house and his, clad only in her "shift," which was discarded after the ceremony for more suitable clothes which he had brought.

English funeral feasts were major social events in early colonial days. The grief of near relatives was lessened by the necessity of extending the hospitality of the home to friends and neighbors. The procedure was described by Gottlieb Mittelberger in 1754:

"When some one has died, especially in the country, where on account of the intervening plantations and forests people live far from one another, the time appointed for the funeral is always indicated only to the four nearest neighbors. Each of these, in turn, notifies his own nearest neighbors. In this manner such an invitation to a funeral is made known more than fifty English miles around in twenty-four hours.

"If it is possible, one or more persons from each house appear on horseback at the appointed time. While the people are coming in, good cake cut into pieces is handed around on a large tin platter to those present. Each person receives then, in a goblet, a hot West Indian Rum punch into which lemon, sugar and juniper berries are put, which gives it a delicious taste. After this, hot and sweetened cider is served. . . . The assembled people ride in silence behind the coffin and sometimes one can count from 100 to 500 persons on horseback."[13]

Another version of the extravagant feasts at colonial funerals is given by Henry Graham Ashmead:[14] "As soon as death occurred, the neighbors came in and made arrangements for the funeral, scoured the brass-work until it shone like a new coin, scrubbed the floors, baking and cooking. 'Warners' were started out on horseback; they rode to the doors of neighbors and announced in sonorous tones, 'Thyself and family are respectfully invited to attend the funeral of John Smith, Fourth Day next, at two o'clock'. Others went to the cross-road store to lay in a supply of groceries. . . .

"Following is a bill for the funeral services of one John Middleton of Chester County (now Delaware County) in 1719:

To 6½ gallons of wine at 6 s.-6 d. per gal.	£02	02 s.	3 d.
To 3 gallons of rum at 4 s.-6 d. per gal.	00	15	6
To quar. of a hundred sugar and spice	00	15	0
To flowar	00	12	0
To a barroll sider	00	12	0
To butter and ches	00	16	0
To a holand sheet	01	00	6
To the cofing and diging the grafe	00	19	6
	£7	10	9"

Funerals were a major social event among the early Pennsylvania German farmers. "The greatest festive occasion of the Germans," says P. E. Gibbons, "or the one which calls the greatest number of persons to eat and drink together, is the funeral. . . . When a death occurs our 'Dutch' neighbors enter the house and relieve the family as far as possible from the labours and cares of a funeral. Some 'redd up' the house. . . . Others help to bake great stores of bread, pies and rusks for the expected gathering. . . . At funerals occurring on Sunday three hundred carriages have been seen in attendence; and so great at all times is the concourse of people of all stations and all shades of belief, and so many partake of the entertainment liberally provided, that I may be excused for calling funerals the great festivals of the 'Dutch.' . . . The tables are sometimes set in a barn or large wagon house and relays of guests succeed one another. . . . A Lutheran gentleman living in Berks County says, 'Our Germans look forward all their lives to their funerals, hoping to be able to entertain their friends on that great occasion with the hospitality due them'."[15] Germans had feasts at baptisms, also.

Among the Scotch-Irish, on the other hand, funerals were conducted with the utmost simplicity. There was little or no feasting, but a jug of "Old Monongahela" might be passed around. The service was held at the home of the deceased and interment was in the family burying ground on the farm. There was no undertaker; the coffin was made by friends of the family or by a local carpenter. This was the only expense; neighbors dug the grave and provided a wagon to serve as a hearse. When means of communication were mere bridle-paths, the coffin (slung on poles) was carried on the shoulders of four men.

The custom of providing elaborate feasts for a large number of guests at funerals began to decline among the English about 1760 but persisted among Germans for many years thereafter. Sometimes the finances of the family were seriously cramped in order to provide "funeral baked meats."

PARTIES

The social parties of young folks in the earlier days almost invariably were held in homes. They were called, very appropriately, "kissing parties"; in all the diversions, either as part of the game itself or as a penalty, every girl present was kissed at least once, in spite of her insincere protests. The dances were boisterous four-handed reels and jigs. Time was kept by a fiddle, clapping hands and stamping feet, accompanied by the giggling of girls and guffaws of boys.

> Go choose the one that you like best;
> If he's not here to take your part,
> Go choose another with all your heart.

Folk songs from the Old Country were sung. Mother Goose rhymes that now are considered children's songs, such as "Under the Juniper Bush," and "Oats, Peas, Beans and Barley Grows" were sung with gusto, the climax of each verse being a kiss. Not until every girl had been kissed at least once was a new song started, but girls who were kissed first enjoyed a social triumph. Country girls did not share the feelings of a prim Philadelphia maiden who confided to her diary, "One hates to be always kissed, especially as it is attended with so many inconveniences; it discomposes the oeconomy of one's handkerchief, it disorders one's high roll [hair-do], and it ruffles the serenity of one's countenance."

An observant visitor from the old county in 1802 records, "The chief amusement of country girls in winter is sleighing. I have never heard a woman speak of this diversion but with rapture. In sleighing weather the tavern and inn keepers are up all night and the whole country is in motion. When the snow begins to fall, the planter's daughters provide hot sand, which at night they place in bags at the bottom of the sleighs. Their sweethearts attend with a couple of horses and away they glide with astonishing velocity, visiting their friends for many miles around. . . . But in order to have a sleighing frolic in style it is necessary to provide a fiddler, who is placed in the head sleigh and plays all the way. At every inn they meet on the road the company alight and have a dance."[16]

In northern Pennsylvania, where snow came more frequently and laid longer than in the southeastern counties, sleighing was a very popular diversion. "What person of sixty or seventy years of age," wrote Henry B. Plumb in 1885, "does not remember with pleasure the sleigh-ridings of their young days? How everybody kept open house, as it were, even into the night, when sleigh-bells were heard in the crisp, cold winter air. How the joyous party would stop where any young folks lived; how there would be a rush of girls and boys with red noses and cheeks into the house; how the metheglin [a cider-honey drink], and mince pies, and doughnuts, and apples, and nuts were brought out and eaten and drank; and how they rushed off with shouts and laughter and tumbled into the sleigh or sled among quilts and comforters and coverlets and straw and sped away, laughing and singing, to the next house."[17]

FAMILY AND SOCIAL DRINKING

Family and social drinking of ardent spirits was almost universal until after 1840. There was little or no hygienic, moral or religious sentiment against the manufacture, sale and use of alcoholic beverages. The production and sale of liquor was thought to be as legitimate as the production and sale of wheat or potatoes. Women entertained their women friends with whiskey "made palatable with sugar, milk and spice." Alcoholic beverages were thought to be essential to good health. It was considered to be "an insult to the stomach of a gentleman to force it to accept food without giving it a gentle and stimulating warning that it is about to be called upon to perform its functions."

"At the beginning of the eighteenth century," says the observant Henry G. Ashmead, "nothing could be done without drink. At the birth of an infant the women of the neighborhood gathered at the house and wine and cordials were distributed to the guests, while hot or buttered rum was given to the mother to hasten her recovery. At house and barn raisings a cedar branch, fastened on the top of the building, announced that good cheer would supplement the work. No crop could be gathered without supplying drink in liberal quantity. In 1700, at funerals, a servant carried sugar cakes and hot liquor around to guests, young and old."

The abuse of this hospitality became so great that at the Chester Monthly Meeting, on December 22, 1724, Friends took action: "At our Quarterly Meeting it was desired ye friends take care at Burralls not to make great provision as to provide strong Liquors & hand it about; but lett Every one be free to take it as they have occasion and not more than will doe them Good." [18]

This counsel was followed in letter if not in spirit; people continued to drink "as they had occasion" and not more—as they thought—than would "doe them Good." There was prodigious public tippling. In 1736, at the Red Lion Inn in Philadelphia one Thomas Apty "laid a wager of Half a Crown that he could drink, within the space of one hour, and a half, a Gallon of Cyder Royall; which he had no sooner accomplished and said, 'I have finished,' than he fell down and expired." In 1818 William Cobbett wrote from Philadelphia to friends in England, "All the materials for making people drunk or muddle-headed are much cheaper here than in England. . . . Come on, then, if you love tippling, for here you can drink yourself blind at the price of sixpence."

The Scotch-Irish, who among other characteristics, brought an appetite for whiskey to the New World, were foremost in family and social drinking. Judging by the daily consumption of "Old Monongahela" in western Pennsylvania about 1790, whiskey, not bread, was their staff of life.

"The belief that whiskey was 'a good creature of God,'" says Rev. Robert A. Brown, "infested men's minds. In practice they were true to principle. . . . What was good for others was certainly good for themselves. The farmer and his boys all drank. The storekeeper kept liquor free for his customers on the counter. The guest in respectable homes was treated to it universally. The pastor was expected to drink it as a pledge of hospitality on entering a dwelling, and again to drink at his departure. . . . It is a wonder that religion survived."[19] The ordination of a minister usually was accompanied by a tremendous drinking bout in which the minister himself often participated.

Occasionally even ministers fell from grace in this respect. About 1760 the presbytery of Donegal tried a minister for drunkenness. Painfully aware of their own shortcomings in this respect the members of the ecclesiastical court rendered the following discreet verdict: "We judge that he is censurable; and yet, as we apprehend the small quantity of liquor which Mr. Lyon drank might produce the above effect after he came out of the extreme cold into a warm house, near the fire, we do not find sufficient cause to condemn him."

Heavy family and social drinking was by no means confined to Scotch-Irish; it was almost universal throughout the province and state. "Of all the old-time enterprises," says Louise Wells Murray of Bradford County, "there were none that could exceed in number the distilleries. Not a town in the county but could boast of its full quota. . . . The whiskey made then was a pure article, very different from present whiskey. Even when there were six whiskey stills at Tioga Point drunkenness was almost unknown, although liquor was freely used in every household and it was a lack of courtesy not to offer it to guests, even to the minister. The terrific labor necessary in those days quickly worked off the fumes of liquor."[20]

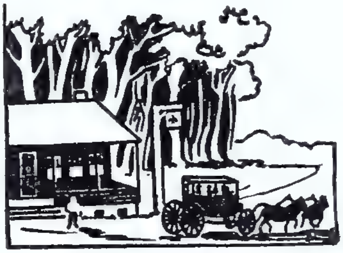
H. Hollister, historian of the Lackawanna Valley, states, "One prominent and almost universal characteristic of the people ['Connecticut Yankees'] was the love of whiskey. . . . The bewildering draught that they drew from the ripened grain was used from the cradle to the grave. Children were put to sleep by eating bread soaked in whiskey and maple sirup and gave no trouble to mother or nurse."[21]

The following newspaper account of a Fourth of July celebration at Bedford in 1808 is typical of the times: "Yesterday the anniversary of American Independence was celebrated at this place with unusual demonstrations of joy and enlightened patriotism. . . . At two o'clock, immediately after a discharge of musketry, the whole company sat down to an elegant dinner. . . . After the cloth was removed, seventeen regular toasts were drunk, one for each of the seventeen states of the Union, with unanimous bursts of applause, intermingled with martial music and patriotic and sentimental songs. . . . The company then, with increased joy, approaching enthusiasm, drank several volunteer toasts. . . . At sundown they marched to the center of the town where the joyful scenes were closed by a discharge of musketry."[22]

Not until sometime after 1840 was there any noticeable or considerable abatement in the consumption of ardent spirits. In 1774 Anthony Benezet published at Philadelphia a book strongly condemning the current inordinate use of liquor, but it met a very cool reception. The first temperance society in Pennsylvania was "The Darby [Delaware County] Association for Discouraging the Unnecessary Use of Spirituous Liquors," organized in 1819.[23] In its first address to the public this association protested against the then prevailing use of liquor in harvest fields. Between 1820 and 1840 temperance societies were organized all over the state. "The Pennsylvania Society for Discouraging the Use of Ardent Spirits" was organized in Philadelphia in 1827; in 1834 its name was changed to "Pennsylvania Temperance Society."

John B. Gough and other temperance crusaders made many converts in this state. "A few weeks ago," said a disgruntled gentleman of Lancaster in 1841, "we had lecturers, concertizers, negro minstrels, dwarfs, giants and a theatrical company whose members were equally inspired by gin and Shakespeare. Now we must content ourselves with long-haired temperance and abolitionist lecturers." In 1854 Timothy Shay Arthur of Philadelphia published his *Ten Nights in a Barroom.* This was soon dramatized: its influence for temperance was scarcely less than that of "Uncle Tom's Cabin" for the emancipation of slaves. After 1860 the use of liquor in rural districts gradually declined.

XIX



SOCIAL CUSTOMS IN THE COMMUNITY

THE country village and the county seat provided diversions quite different from those which centered in the home. The village comprised one or more churches, a store, a tavern, smithy, the shops of several other local craftsmen, homes of community professional men—ministers, lawyers, doctors, schoolteachers—and homes of aged farmers who, their active lives finished, had turned over their farms to younger hands and had come to town,

> To husband out life's taper at its close,
> And keep the flame from wasting by repose.

Each rural community had a distinctive social life, determined largely by the nationalistic group that comprised a majority of the population.

Rural Social Centers

The most important social center was, of course, the church. Country people were, for the most part, deeply and sincerely religious. Many settlers had fled to America to escape religious persecution in Europe; this tended to cement the fellowship of the church. On the Sabbath day the clear tones of church bells carried far out over the countryside, calling families to worship.

In early days churches sponsored few, if any, social occasions as such; but men, women and children lingered for friendly intercourse after the service, or between services. When farm families came to church from long distances, walking or on horseback, they often stayed the entire day. There might be a two hour sermon in the morning and another of similar duration in the afternoon; during the noon intermission picnic dinners were spread in the grove around the church. This was the "social" of the early rural church.

The school did not emerge as a center of community life to any considerable extent until after 1840, although the organization of neighborhood subscription schools brought people together frequently.

The country store was not only the emporium of the neighborhood but also a social center. When farmers or their wives repaired to the store once a week to exchange eggs, butter and cheese for sugar, salt, tea and spices, they were certain to find there several of their neighbors on the same errand, especially in winter. The big box stove glowed with comfortable heat. It was flanked by boxes of sawdust strategically placed to receive tobacco juice.

Perched precariously on cracker barrels, boxes and nail kegs ranged round this hospitable center, farmers sat in judgment on the evils of the times, national and local politics, major and minor events in community life.

Wit and humor bloomed in this genial habitat. Theology, farming, politics, and the personal peculiarities of neighbors not present were discussed with partisan heat. The characteristic aromas of plug tobacco, brown sugar, whiskey, molasses and leather blended to provide a stimulating atmosphere for these discussions. When his duties permitted the store keeper joined in; his opinions carried weight for he was a man of importance in the community, being banker and middleman as well as merchant. The store was an informal community forum. The consensus of opinion developed by "cracker box philosophy" determined the ultimate outcome of many issues, national and local. It was democracy at work.

The local inn or tavern not only provided welcome food, drink and shelter for travellers but also served as a social club for the neighborhood. Its taproom was a loadstone to farmers who were thirsty for companionship as well as for the wherewithal to "wet their clay." Usually this was the largest room in the village; lectures, entertainments, political speeches and dances were held here as well as in the large room above the store. All public notices were posted here—legal, lost and found, lottery and lists of jurors.

The indispensable feature of all inns was a bar. This provided liquid sustenance not only for weary wayfarers but also for local people. In the evening farmers gathered there to hear news of the day from travelers who were staying for the night and to discuss neighborhood events. The inn was a rendezvous of politicians and a polling place at elections. Magistrates often held court in the great barroom. Auctioneers, quacks and lecturers held forth there. The inn was the hang-out of village idlers and roisterers as well as a meeting place for substantial farmers. On the arrival of the stage it was a scene of feverish activity.

The shops of the Pennsylvania village craftsmen—blacksmith, wheelwright, cabinet-maker, tailor, cobbler, harness-maker—were informal gathering places for rural people. The most important of these was the blacksmith shop, not only because of the fascination of white-hot iron and ringing anvil, but also because a great variety of small articles for farm and home were fashioned there. Some of these were listed by Henry B. Plumb of Luzerne County:

"As to tradesmen, the blacksmith stood at the head of all in this new country. Almost everything made of iron was made by him. He made the plows—of wood and sheathed with iron. He ironed off the wagons and carts. He made scythes, reaping hooks, axes, knives in general, chisels, drawing knives, shears, sheep shears, garden hoes, grub hoes, spades, shovels of all kinds, hammers, rakes, harrows, pitch-forks, stable forks, andirons, flatirons, door handles, latches, hinges, locks, cowbells, shod horses and oxen, made the irons of hames and harness, steel for flint and steel, iron lamps for burning lard, nails of all kinds, griddles, tongs, pokers, sled-shoes, chimney cranes, pot-hooks, cranks for grindstones, spinning wheels, spindles, chains and thousands of other things."[1]

Another important social center was the grist mill, where farmers had to go frequently, and lingered to talk with others on the same errand. Such was the open-handed hospitality of the times that the miller, or "duster," often invited them to dinner while they waited for their grist.

PUBLIC OCCASIONS

Contests of skill were almost as popular with men and boys as hunting and fishing especially among the Scotch-Irish. They vied with each other in running, jumping, wrestling, pitching quoits or horseshoes, throwing the hammer, shooting at mark with rifle or bow and arrow. On the frontier, shooting matches were in high favor since protection from Indians and wolves, and the family meat supply, depended on keen eyes and accurate rifles. Nearly every wedding, barbecue and patriotic celebration featured shooting matches.

Forum at the country store.

The birthday of the republic was everywhere celebrated with strong patriotic fervor. It was the great day of the year for young and old; practically all farm people went to town to see and be seen. Their ears were stunned by the firing of cannon, the ringing of bells and the beating of drums. Their eyes were dazzled by spectacular parades and torch-light processions. Their patriotism was fired by speeches that made the eagle scream. Their stomachs were satiated with ice cream, pink lemonade and sweets. Before the day was over the senses of some of the men, at least, were likely to be dulled by copious social drinking. It was, indeed the "glorious Fourth." Fireworks were not used much until after 1830; then Roman candles, fire-wheels, fire crackers, red fire, pin-wheels, sparklers, bombs, snakes, sky rockets and set pieces began to appear, to the ineffable delight of small boys.

In spite of many extraneous circumstances connected with the observance of the Fourth of July, some of them unfortunate, it was essentially a patriotic celebration. In 1835 a Crawford County pioneer recalled the Fourths of his youth: "Fourth of July was for many years celebrated by the raising of a tall liberty pole with the bark off, from which floated the flag. Alongside of it was created a bower made of forked poles planted in the ground, over which boughs and leaves were thrown, forming a shade. Under the bower was built a long table with seats. Here would assemble citizens of the town and country and, after enjoying a sumptuous dinner, patriotic speeches were the order of the day." [2]

In the early years of the newly formed United States each township was expected to enroll all able-bodied males over twenty-one and under forty-five years of age as armed militia. They were required to report at county seats once or twice each year with some kind of a musket. Usually there was an encampment of three days, two days for muster and drill and one day for public review. Township militia companies elected their own officers. Most militiamen had no uniforms; they wore homespun. Muster days were the occasion for a general community picnic, with amusements, athletic contests, games of chance and visiting.

"Corn-stalk militia" (some who had no muskets carried corn-stalks) soon fell into disrepute. Muster took time from necessary work, the drilling was poor and there was much rowdyism. Camp grounds were infested with liquor sellers; sometimes they even dispensed dippersful of whiskey to militia while they were still in line. Brawls and fist-fights were common. The act establishing muster days was repealed in 1848.

Court day was an important social occasion for country people; they came to the county seat from long distances. Hangings were a gala occasion. Until after 1840 they were open to the public and thousands, including little children, came to see the gruesome spectacle. Liquor flowed freely and the band played patriotic airs. The spectators were not bloodthirsty; they were merely callous and avid with curiosity.

Annual county and local fairs were an exciting and important feature of rural community life from the founding of the colony. They were an adaptation of the ancient German *Jahrmarket* and were initiated by the founders of Germantown soon after their arrival. Cazenove describes the fair held at Lancaster in 1794:

"During the Fair, which lasts for three days in June and while Court is held (which is once every three months), all the County farmers and their children always come to Lancaster and then everything is good cheer. All the young farmers, men and women, must have pleasure, as they have none the rest of the year. People say that nothing is more interesting than their loud joy and the big kisses exchanged everywhere by the sweethearts who fill the streets. So young people have an opportunity to see each other and marriage follows; while the fathers get drunk in the taverns."[3]

The original agricultural and industrial objectives of fairs, as set forth by William Penn, were soon overshadowed by spectacular entertainment features, such as horse racing and games of chance. The first successful balloon ascension in America was at Philadelphia on January 9, 1793; it rose 5,812 feet and was in the air several hours. Thereafter a balloon ascension vied with horse racing as a drawing card at fairs. About 1820 the agricultural features of fairs were revived, under the stimulus of governmental aid.

Auctions of farm and household goods were important social events. They were held preferably in autumn, after crops were laid by, but sometimes in spring. Between efforts to secure "bargains" and listening to the jovial chatter of the auctioneer, much neighboring was done. Regret at the breaking up of farm homes by death or removal was submerged in the pleasure of meeting old friends from far and near.

The circus was an outstanding rural entertainment from 1790 until 1820, when a great religious movement almost eliminated it. Ministers of that period inveighed against the circus as a perverter of morals. By 1835, however, it was re-established in popular favor. After 1815 small circuses began to travel through the rural districts. Rarely did they have more than eight "artists," three wagons and six horses. The performers included an acrobat, clown, equestrienne, trumpeter, fiddler and drummer. Occasionally a wax-work exhibit from town went on tour.

Early circuses had no menagerie of wild animals. These were exhibited by their trainers at taverns and cross-road stores. In 1808 the *Pittsburgh Gazette* advertised that an elephant would be on exhibition in that town and the public was advised, "The present generation may never have the opportunity of seeing an Elephant again, as this is the only one in the United States." "After 1812," says Henry B. Plumb, "some shows came into the Wyoming Valley. An elephant, a monkey or a learned pig drew great crowds." Some traveling shows featured cock-fights and bull or bear baiting.

By 1840 circus men had pitched their tents in all but the most sparsely populated counties of the state. Their preposterous posters drew farm families from their homes like a magnet. A small menagerie accompanied the show. Wide-eyed children stared in awe at "man-devouring tigers" and other fearsome beasts. Amusing hoaxes, games of chance, and the patter of "barkers" for sideshows added zest to the outing. The supreme circus man of all time, P. T. Barnum, began his long and profitable career of amusing as well as fooling the public; he capped sensation with super-sensation in his "Greatest Show on Earth."

AMUSEMENTS

The founders of the Commonwealth looked with jaundiced eyes on all forms of amusement; to them, life was a very serious matter which should be passed without frivolity. The Great Law of 1682 provided, "All such offences against God as . . . prizes, stage plays, cards, dice, May-games, masques, revels, bull-baiting, cock-fighting and the like, which excite the people to rudeness, cruelty and irreligion, shall be respectively discouraged and severely punished."[4] Anyone who so far forgot his moral obligation as to play cards, roll dice or engage in "other such enticing, vain and evil sports and practices" was fined five shillings or jailed for five days at hard labor. Except among strict Quakers and German sectarians, however, this high standard of conduct was observed with moderation; even some of these austere brethren fell from grace occasionally.

In 1683 the first Colonial Assembly made it definitely unlawful to introduce or frequent "stage plays"; the penalty was imprisonment for ten days or a fine of twenty shillings. The theater was anathema to Quakers, Germans and Scotch-Irish alike, who comprised a majority of the population. Philadelphia had puppet shows during the period 1682 to 1750 but no dramatics.

In 1750 a company of English players brought to Philadelphia the best of English drama, mainly Shakespeare and Addison. The success of this venture encouraged a little group of Philadelphians to undertake to produce a play, but it was suppressed by the magistrates. Henry Hallam, the "father of the American stage," made an appearance in Philadelphia in 1754 but encountered bitter opposition. The Orpheus Club was founded in Philadelphia in 1759; it produced the first American play "The Prince of Partha," by Thomas Godfrey, Jr. In 1766 the Old Southwick Theater, the first American theater, opened in spite of vigorous efforts to prevent it; but soon this and other early theaters in Philadelphia were closed by court action.

While the British occupied Philadelphia during the Revolution the drama flourished. After the patriots had retaken the city the Congress passed a resolution that any person holding Federal office who attended a theater or who encouraged another to attend should be deemed unworthy of holding public office and should be dismissed. Similar action by the General Assembly of Pennsylvania followed.

In 1783 a petition to the Legislature signed by many citizens declared, "The theater is extremely sinful; . . . that this idle, licentious, pernicious pleasure would be wickedly and ruinously inadvertent, showing the greatest ingratitude to Providence; that the young would be thus debauched, led away into dissipation and every vicious tendency, and the taste for the orderly and virtuous joys of domestic and social life be corrupted; that conjugal unfaith would be so occasioned, disorder and extravagance be increased among the citizenry, the spread and confirmation of the true religion hindered."[5] Commenting sarcastically on this declaration Johann David Schoepf remarked in the following year, "In a word, the play is described as the source and school of every vice, the direct road to Hell and the certain means of destruction to the State."

In 1789, after lengthy controversy, legislation was passed authorizing theaters to open under certain conditions. Thereafter the drama became a popular diversion in urban centers. Not until long after 1840, however, did any considerable number of farm people patronize theaters or include "plays" in programs of rural entertainment.

The Quakers of Pennsylvania, like the staunch Puritans of New England, distrusted music. They might have abolished it altogether, by legislative fiat, had not the ancient Hebrews sung psalms in their religious services. Germans, however, were music lovers. Music was a part of their religion. The male and female choruses at the Ephrata Cloister and the instrumental and vocal music of the Moravians at Bethlehem, beginning about 1741, were the first significant group expression of the love of music in America. Conrad Beissel, founder of the Ephrata Cloister, wrote the first American book on harmony. Many hymns were composed by this community. Benjamin Franklin printed hymn books for the Cloister in 1730, 1732 and 1736 at Philadelphia; and Christopher Sauer in 1739 at Germantown. No secular music was permitted at the Cloister.

The church music of the Moravians at Bethlehem and Lititz employed the violin, viola, flute and French horn in addition to the organ and chorus. Their concerts were famous throughout the colonies; Washington and many other public men travelled long distances to hear them. In 1748 the Moravians established "Collegium Musicum" for training in both sacred and secular music and to give concerts. The celebrated Bach Choir at Bethlehem and its annual Bach Festival developed out of early Moravian cultivation of music. The first public concert in America was at the Reformed Church in Philadelphia on May 4, 1786; there were 250 vocal and fifty instrumental performers.[6]

Aside from these outstanding exponents of musical taste there was little music in the lives of Pennsylvania farmers except the church music of Germans. They loved to sing. To them, the hymn book was sacred, second only to the Bible. Hymns of the church were raised at every service. In congregations where hymnals were scarce, "lining out" hymns was practiced. The minister or choir leader read a line of a hymn, then the congregation sang it, and so on, alternately, to the end. The schoolmasters of church schools were choir leaders and taught singing in the schools.

In most English and Scotch-Irish farm homes music was mostly confined to folk songs brought over from the Old Country. These were sung at neighborhood gatherings to the accompaniment of fiddle or flute. Melodeons came into farm homes after 1840.

Singing schools began to find favor about 1820; by 1840 they were a very popular rural diversion. W. J. McKnight of Jefferson County recalls the singing schools of his boyhood: "About 1840 music-teachers traveled through Jefferson County and taught classes. A class was twenty-six scholars, a term thirteen nights and the tuition fee fifty cents for each scholar. Teachers used tuning forks and some played a violin in connection with the class singing. The only music books were *The Beauties of Harmony* and *Missouri Harmony.* Each contained the old 'buckwheat' notes of *me, fa, sol, la.* Everyone could not afford one of these books. The teachers opened the singing by exhorting the class to 'sound your pitches—*sol, fa la.*' "[7]

Although the lotteries were more closely akin to gambling than to amusements they may be considered a diversion, since the hope of acquiring unearned gain kept thousands of ticket-holders interested and expectant—also poor. Lotteries were common from 1747, the date of the establishment of the first public lottery in Pennsylvania, to 1833, when they were abolished by act of General Assembly.

Lotteries were used to finance a variety of public improvements; to build schools, churches, court houses, turnpikes, bridges, wharfs, pave streets and to pay the expenses of government, state or local. At one time practically all the cost of operating the state government was paid from funds derived from a state lottery. The majority of people were poor and direct taxes were onerous to them, hence funds for public improvements often were raised indirectly through lotteries. Some lotteries were conducted for purely private purposes.

All lotteries had to be authorized by the General Assembly. The Legislature of 1808 authorized twenty-five. Among those listed were: "For finishing a church in the town of Columbia, Lancaster County. . . . For erecting a schoolhouse in Myerstown, Dauphin County. . . . For purchasing a burial ground for the Society of Universalists in the city of Philadelphia. . . . For improving the road leading from Catawissa to Reading. . . . To enable the inhabitants of York to bring in a stream of water to supply their fire engines."[8]

So many abuses developed that on February 17, 1762, the Legi ture passed an Act restraining lotteries. It declared, "All lotte whatsoever, whether public or private, are common and public nuisances and against the common good and welfare of the province."[9] After 1800, however, they again came into favor and by 1830 were at their height.

Lotteries were demoralizing to the morale of many people. Old and young, rich and poor, gambled with their earnings and feverishly awaited the outcome of their throw in the game of chance, frequently neglecting their work the meanwhile. They brought unearned and quickly-vanishing wealth to a few but poverty and despair to many. Lotteries were abolished by Act of General Assembly on March 1, 1833.[10] It is estimated that between 1747, the date of the establishment of the first public lottery in Pennsylvania, to the passage of the act for the abolition of lotteries in Pennsylvania, in 1833, more than 8,000,000 tickets were placed on the market and prizes awarded totaling $50,000,000."[11]

By 1840 no one could fairly assert that the rural people of Pennsylvania were destitute of means of diversion. Surely that caustic English critic of American social life, Mrs. Frances M. Trollope, dipped her pen in venom when she wrote, in 1828, "I never saw a population so totally divested of gaity. . . . They have no fetes, no fairs, no merry-making, no music in the streets, no Punch and puppet shows. . . . They have no forgetfulness of business and of care—no, not for a moment. But I will not stay long, for I should not live."

MORALS AND MANNERS

Standards of morality and decorum change with the years; customs and practices which are condemned by one generation may be approved, or at least condoned, by the next. In general, moral and ethical standards are higher today than they were a century or more ago. A notable exception is the public and private attitude toward the sacrament of marriage.

Our colonial ancestors had a deep abiding respect for the religious sanctity of the marriage vow. Marriage was for life—"till death us do part." Divorce was rare; divorcees were ostracized socially. Marital difficulties seldom were aired in the courts.

Marriage was about the only career open to women in pioneer days. It was an economic necessity for both sexes; it was entered into not only as a spiritual and physical union but also as a mutually advantageous economic partnership. This attitude reflected the social and economic conditions of the times. All women of child-bearing age could find husbands. A widowhood of more than one year was considered to be unjustified and an offense against society. Not until a half century after the Revolution, about 1830, when industrial development began to open new avenues of interest and service for women, did marriage become more optional for them.

Infidelity of partners in marriage was rare but intercourse between young lovers before marriage was common and was condoned, provided marriage followed. During the first century of the province no provision was made for divorce except on the ground of adultery. In 1785 the General Assembly passed an act authorizing divorce on the ground of "adultery, impotence, or wilful and malicious desertion for a period of four years."

The ancient Old World custom of bundling, especially in Britain, Holland and Switzerland, was practiced in all the northern colonies but was more common in Pennsylvania than elsewhere. Bundling was done only in winter, the primary purpose being to lessen the danger that courting couples would catch cold at night in a frigid room. It also arose from the limited sleeping accommodations of pioneer homes, where several persons, perhaps of both sexes, often had to sleep in one bed. Parents permitted their daughters to bundle (lie in bed or on the floor without undressing) with their sweethearts or, when necessary, with strangers who had sought the hospitality of the home for the night. This was before inns were common and when most farm homes were one-room cabins.

After doing a hard day's work a youth might walk or ride five to ten miles to see his sweetheart. In winter he sat with the family in the one-room cabin until the others retired, the children to the loft, the parents to a bed in a corner of the room. Then the young folks laid down together on a bed of skins or rushes before the fireplace and continued their courtship, perhaps far into the night.

The commendable aspects of bundling were set forth by Johann David Schoepf in 1783: "It is the custom for young men to pay visits to their mistresses, and the young woman's good name is in no ways impaired. . . The parents are advised and these meetings happen when the pair is enamoured and merely wish to know each other better. The swain and the maiden spend the evening and the night undisturbed by the hearth or, it may be, go to bed together without scruple; in the latter case with the condition that they do not take off their clothes; and if the anxious mother has any doubt of the strict virtue of her daughter she takes the precaution of placing both the daughter's feet in one large stocking, and in the morning looks to see if this guardian is still properly fixed. But the inquiry is commonly superfluous, the circumstance having rarely any other consequence than regular bethrothal, which is the object had in view in allowing the meeting."[12]

Until about 1750 bundling was generally accepted as necessary under frontier conditions and usually was practiced with discretion. After the French and Indian wars many young men returned from army camps where they had acquired loose habits; then bundling was deprived of the innocence it formerly had possessed. Not until about 1800, however, was bundling in such general disrepute at the bar of public opinion that it was discontinued.

In the beginning the province had little need of courts. Quakers were averse to litigation of any kind. In a letter to the Free Society of Traders Penn stated, "To prevent law suits there are three peace-makers chosen by every county court, in the nature of common arbitrators, to hear and end differences between man and man." Their authority was derived from a provincial statute. The Society of Friends had regulations requiring that all differences between Friends be submitted to their respective Monthly Meetings for adjustment.

The penal laws of colonial Pennsylvania were based on those of England at that time. Many of them were brutal and revolting. Only with respect to the death penalty was punishment moderate; this was imposed solely for murder or treason, whereas in England and the colony of New York over 200 offenses were, in early days, punishable by death.

Punishment for some comparatively minor offenses was extreme. Men and women were branded on the hands with hot irons; their ears were cut off and nailed to whipping posts; they were sentenced to stand in the pillory exposed to public ridicule and abuse; and to receive publicly a specified number of lashes, "well laid on". Usually the pillory was erected in the market place and the sentence was executed on market days when the populace could gloat over the punishment of their wayward neighbors. Sometimes these self-righteous citizens pelted the pilloried individuals with rotten eggs. If a man was unable to pay his debts or a fine he was auctioned off to the highest bidder, like a slave, to serve a "master" for a period specified by the court. Imprisonment or servitude for debt remained in force until 1786. The whipping post was abolished in 1790.

The sentence meted out to Peter Heaton of Bucks County in 1780, for larceny, is representative of court justice at that time: "The Court adjudges that he stand in the pillory one hour, be whipped with thirty-nine lashes, and at the same time shall have his ears cut off and nailed to the pillory, the above punishment to be inflicted this day, ye 14th, between the hours of 12 & 3 o'clock in the afternoon; and to pay all costs and make restoration."[13]

The pioneer "Yankee" farmers of the Wyoming Valley brought with them from New England the thrifty habits of their forebears. They were averse to supporting wrong-doers in jail. Says Hendrick B. Wright, "Whipping and banishment were the two penalties for crime. Our pioneers went upon the principle that it was not worth their while to be bothered with lock-ups and to be taken from their useful occupations to lounge about the courts. . . . So, for a small offense, they tried the culprit and, if found guilty, tied him up to the whipping post and gave him ten or twenty lashes. Thus fifteen minutes ended the whole matter and the court, constable, complainant, witnesses and criminal could all go to work, and probably in the same field (the 'Big Flats'). Those who committed felonies and intermediate grades of crimes were banished. . . . Labor was honorable then and idleness a punishable crime."[14]

In pioneer communities personal rectitude was maintained more by public opinion than by court action. Joseph Doddridge, writing of early days of southwestern Pennsylvania about 1763 says, "The punishment for lying, idleness, dishonesty, and ill-fame generally was 'hating the offender out', as they put it. This commonly resulted in reformation or banishment."

Pioneer society was rough and fights were common. In these combats men could use fists, teeth and feet at will and no holds or blows were barred. Even that most detestable of all rough-and-tumble fighting practices—gouging out of the eyes of an opponent with finger nails—was considered legitimate in some quarters.

Most men smoked pipes, and many women smoked or dipped snuff. Smoking cigars was limited to certain times and places; there were no cigarettes. Foremost of "bad habits," as viewed by European visitors, was the almost universal practice of chewing tobacco and spitting out the juice promiscuously. The chewing plug bulged the hip pocket of nearly every man. Fortunate indeed was the passing lady whose billowing skirts were not spattered with amber juice.

THE MAIL

The isolation of country life in colonial days was but slightly relieved by mail and travel. Mail was dependent on facilities for transportation, which were meager. Carrying mail began as a private enterprise. In July, 1683, William Penn issued an order for the establishment of a post office at Philadelphia and authorized Henry Waldy to operate it and "to supply passengers with horses from Philadelphia to New Castle or to the Falls [Trenton]." He fixed the following postal rates: "Letters from the Falls to Philadelphia, 3 d.; to Chester, 5 d.; to Maryland, 9 d." The post was supposed to go once a week, but the postman need not start until enough letters were received to pay for the trip. Notices of the expected time of arrival and departure of mail were posted on the Meetinghouse door and in other public places. Mail was carried by post riders on horseback, each man carrying it about twenty-five miles.

In 1693 a general postal system was organized in Philadelphia by Andrew Hamilton as a private enterprise. It conveyed letters and small packages to all the colonies and to foreign countries. The postage on a letter from Philadelphia to New York was four pence half penny; to Boston, fifteen pence; to any place within eighty miles of Philadelphia, four pence half penny. In 1700 John Hamilton of New York devised a postal system for which he obtained a patent and which he sold to the British Crown. In July, 1742 the Moravians at Bethlehem established a weekly post between that settlement and Philadelphia. By 1753 mail between Philadelphia and the three other main centers of population—New York, Boston and Baltimore—still went only once a week and much less frequently to interior points in the province, as Lancaster and Reading.

Post offices were in homes, stores and inns. Letters might be thrown down on a tavern table or bar and lie there many days before anyone claimed them. Many were lost. The postman not only carried the mail but also did buying and selling for people along his route.

In 1754 Benjamin Franklin was made Postmaster General. With care and efficiency he immediately improved the service. Mail was sent to New York three times a week in summer and once a week in winter. By 1767 postal service had been extended to Shippensburg. Letters from Pittsburgh were forwarded by the commanding officer of that fort to Shippensburg for mailing. Mail was still carried by post riders on horseback; not until 1772 was the first stage line which carried mail operated between Philadelphia and New York and Boston.

In 1775 the postal services of the several colonies were taken over by the Continental Congress. In 1788 the Congress directed the Postmaster General to provide regular transportation of mail between Philadelphia and Pittsburgh; this service began on July 3 of that year. Mail was supposed to go between Chambersburg and Pittsburgh every two weeks but often it was delayed several weeks. Weekly mail between Philadelphia and Pittsburgh began in 1794; in 1804 twice a week service, by stage, was begun.

The post was late in coming into the Wyoming Valley. In early years the "Town Sign Post" was the only means of public communication. The voters of each township designated a conspicuous tree to which all notices of a public character must be fixed in order to be legal. Meetings for the transaction of township business often were held beneath this tree. At a Town Meeting of New Providence Township in 1774 it was voted, "That y^e Indian apple Tree, so called, at Capoose, shall be y^e Town Sign-Post for Y^e Town of New Providence." After Luzerne County was organized, in 1786, a weekly mail was inaugurated between Easton and Wilkes-Barre. The first postoffice in the Lackawanna Valley was established in 1811; mail went once a week by horseback to and from Wilkes-Barre.

For many years letter writing was restricted mainly to business men, politicians and other "gentlemen". On many farms a year or more might pass without a letter being sent or received. Illiteracy was high; in 1840 nearly half the people in Pennsylvania could neither read nor write. Even to farmers who had some schooling letter writing was an arduous task, to be undertaken only under dire necessity, with quill pen and home-made ink. "My ink freezes, which obliges me to conclude," wrote an unhappy correspondent in 1720.

Postal rates were high, often almost prohibitive. For many years they were determined by the distance that the letter was to go. In 1815 the postage on a letter consisting of one folded sheet of paper was: under 40 miles, 8 cents; under 90 miles, 10 cents; under 150 miles, 12½ cents; under 300 miles, 17 cents; under 500 miles, 20 cents; over 500 miles, 25 cents. If two sheets of paper were used the rate was doubled; if the letter weighed an ounce, quadrupled. According to W. J. McKnight of Jefferson County, "The postmaster, who was also a merchant, took produce for letters, the same as for goods sold. For postage on a letter going over 400 miles he would receive two bushels of oats, or two bushels of potatoes, or four pounds of butter, or five dozen eggs. To pay the postage on thirty-two such letters the farmer would have to sell a good cow."[15]

Envelopes were not used much until after 1840. A single sheet of paper was folded so that the outside might be blank to receive the address. It was sealed with red wafers or sealing wax. A letter could be prepaid or sent collect; if prepaid the postmaster stamped it "Paid". Postage stamps, if any, were of many sizes and colors, at the discretion of the local postmaster who printed them. The first issue of United States stamps was in 1845, in two denominations, five cents and ten cents.

More expeditious mail service came in 1835, when the Postmaster General inaugurated a "Pony Express" between certain points, mostly large towns. A man on a fast horse carried a leather mail pouch at breakneck speed for a distance of six miles, then he relayed it to another rider. He blew a horn vigorously on approaching the next station so that not a moment might be lost in the transfer. The pony express kicked up dust on Pennsylvania pikes for only a few years; soon it was superseded by stage coach and railroad transportation.

STAGE COACH DAYS

Travel was costly and dangerous in colonial days. It was undertaken only when business required it; there were few pleasure trips. For many years strangers in a community were viewed with suspicion. In 1676 it was ordered, "If hereafter any Stranger or person unknown shall come to or Travail through any Towne or place within this Government without a Passport or Certificate showing from whence hee came and whither hee is bound, hee shall be lyable to be Seized upon by any Officer . . . until hee can Clear himself to be a free Man and shall defray the Charges of his Detention."[16] Prior to 1700 innkeepers were required to notify officers of the law when strangers sought lodging.

Previous to 1840 few farmers made trips of more than fifty miles from home. Their interests lay almost entirely within the borders of their own township. Long journeys were impracticable because of time required, expense and the constant danger of accident.

Until about 1800 most Pennsylvania farmers and their families traveled by water or horseback. "Prior to 1830," says Franklin Ellis of Lancaster County, "very few farmers enjoyed the luxury of a carriage. Only 'grand persons' or 'gentlemen' rode in gigs. 'Common people' went horseback, children in front on a pillow, infants in arms . . . When a farmer's daughter came of marriageable age she received a handsome saddle and bridle and was allowed to use a farm horse to go to church meeting or singing school."[17] Similar concessions were made to young men.

Carriages were not used until after 1750 and then only by the well-to-do. Early vehicles had two wheels and were called gigs. In 1761 there were but eighteen in the entire province and in 1772 eighty-four. By 1783 there were thirty gigs in York county alone, which then included the present Adams County. In towns, some gentlemen still were carried about in chairs. As late as 1789 Eliza Quincy saw Benjamin Franklin in a sedan chair fastened to two bars and carried by four bearers.

Possession of a private carriage, or "chariot," was so uncommon as to stamp the owner as an "aristocrat". Practically all pre-Revolution carriages were imported. They had no springs, and the seats were without backs. After the Revolution a tariff of forty-five per cent was imposed on imported vehicles; then local wheelwrights began to build heavy carriages and coaches. Light carriages and "buggies" did not appear until after 1830.

Between 1750 and 1840 most travel between towns was by stage coach. In 1742 a weekly stage coach and mail line between Bethlehem and Philadelphia was established by the Moravians. In 1756 John Butler established the first stage coach line between Philadelphia and New York, via Trenton. The journey required three days. One could travel on it at a speed of forty miles a day in summer and twenty-five in winter. A line between Philadelphia and Baltimore was established in 1765.

Early stage coaches were merely heavy covered Jersey wagons, imported from England. They had straight sides, three or four movable wooden benches and no springs. It was physical and nervous torture to ride in them over the incredibly rough roads of that period. After the Revolution lighter home-made coaches with springs and leather-covered spring seats began to be used and the pace was quickened. As reported by Johann David Schoepf in 1783, "A diligence, known as the Flying Machine makes daily trips between Philadelphia and New York, covering the distance of 90 miles in one day, even in the hottest weather, but at the expense of the horses, only three times changed on this journey. Thus, the last trip, two horses died in harness and four others were jaded. These flying machines are in reality only large wooden carts with tops. . . . They carry from ten to twelve passengers, with luggage, are drawn by four horses only and go very fast. . . . The price for each passener is 20 shillings."[18]

In 1784 a stage line from Philadelphia to Lancaster was in successful operation; in 1796 this was extended to Shippensburg, which remained the western terminus of the route until 1804.

Stage coach travel increased rapidly after 1800, when the good roads movement began to make headway. Through lines were established. On July 3, 1804, John Tomlinson and Company announced, "A line of stages is being established to and from Philadelphia and Pittsburgh. This line will start from John Tomlinson's, Market Street, Philadelphia, every Friday morning, *via* Harrisburgh and Chambersburgh to Pittsburgh and will perform the trip in seven days. . . . Fare, Passengers, 20 dollars and twenty pounds of baggage free." This was the first stage across the Appalachians.

Stage coach lines carried mail, under contract with the U. S. Post Office Department, as well as passengers. Each traveler took a small pigskin-covered trunk studded with brass nails; this was placed under his feet or seat. Soon inn keepers along the route became partners with coach lines and furnished teams, which were relayed from inn to inn. There were spirited races between competing lines on the same highway. By 1830 the standard speed was ten miles an hour and teams were changed every twelve miles, usually at an inn.

When stage coaches first appeared west of the Susquehanna they met bitter opposition from pack horse men who feared, and rightly so, that the older method of transportation would be put out of business. Coaches were over-turned, horses injured and heads cracked. On the other hand, arrogant coach drivers showed little or no courtesy to other travelers; they crowded pack horse trains off the road and forced drivers of carriages and wagons to pull to one side to let them pass. But the march of progress could not be stayed.

That interesting historian, W. J. McKnight, vividly and accurately portrays stage coach days in western Pennsylvania about 1830: "The daily stage took the mail and carried passengers. . . . There were no tickets sold—the fare was six cents a mile, in advance, to be paid in hard money. . . . The coaches were made in Concord, N. H. and were called 'rockaway coaches'. Each coach had heavy leather belt-springs and was a handsome vehicle, painted red, with gold stripes and letters, and was drawn by four horses. . . . Trunks were carried on the top and in the 'boot' . . . When nearing a relay, or a post office, the valleys and hills were made to echo and re-echo to the 'er-r-a-h, er-r-ah, tat, tat, t-a-tat, t-a-h' of the driver's horn.

"The driver carried a whip with a hickory stock and a buckskin lash ten or twelve feet long, with a silk cracker on the end. These whips were handled with marvellous dexterity and were made to crack over the horses' heads like pistols. The roads in spring, summer and fall were a succession of mudholes, with an occasional corduroy. The male passengers usually walked up the hills."[19]

As viewed from the perspective of the present generation stage coach travel may seem romantic, but in reality it was an exhausting experience, as many of its unwilling victims have testified. The account of Josiah Quincy of his journey from Boston to New York in 1795 might well be a description of stage coach travel in Pennsylvania at that time:

"We generally reached our resting place for the night, if no accident intervened, at ten o'clock and after a frugal supper went to bed with a notice that we would be called at three the next morning—which usually proved to be half past two. Then, whether it snowed or rained, the traveler must arise and make ready by the help of a horn lantern and a farthing candle and proceed on his way over bad roads—sometimes with a driver showing no doubtful symptoms of drunkenness, which good-hearted passengers never failed to improve at every stopping-place by urging upon him the comforts of another glass of toddy. Thus we traveled eighteen miles a stage, sometimes being obliged to get out and help the coachman lift the coach out of a quagmire or rut; and arrived at New York, after a week's hard traveling, wondering at the ease as well as the expedition with which our journey was effected."[20]

Mrs. Frances M. Trollope, a censorious English lady who traveled through Pennsylvania in 1830, had this to say of the trip: "We were tossed about like a few potatoes in a wheelbarrow. Our knees, elbows and heads required too much care for their protection to allow us leisure to look out of the windows."

Thomas B. Searight reminisces about the old days on the National Pike: "Excitement followed in the wake of the stage coaches, all along the road. Their arrival in town was the leading event of the day and they were so regular that farmers along the road knew the exact hour by their coming. They ran night and day alike. Relays of fresh horses were placed at intervals of twelve miles as nearly as possible.

"Teams were changed almost in a twinkling of an eye. . . . The moment it came to a halt the driver threw down the reins and almost instantly the incoming team was detached, the fresh one attached, the reins thrown back to the driver, who did not leave his seat, and away again went the coach at full speed, the usual group of loafers meanwhile looking on and enjoying the exciting scene. . . . The coaches were all handsomely and artistically painted and ornamented and lined inside with soft silk plush. There were three seats, furnished with luxurious cushions, and three persons could sit comfortably on each, so that nine passengers made a full load, in addition to a seat by the driver. During the prosperous era of the National Pike it was not uncommon to see as many as fifteen coaches in continuous procession,"[21]

W. J. McKnight of Jefferson County recalls the stage coach travel of his youth: "The arrival of the stage was a much more important event than that of railroad trains today. Crowds invariably gathered at the public houses where the coaches stopped, to obtain the latest news. The passengers were of decided account for the time being. Money was so scarce that few people could afford to patronize the stages and those who did were looked upon as fortunate beings. A short trip on a stage was as formidable an affair as one to Chicago or Washington is now [1905] by railroad. The stage drivers were men of considerable consequence, especially in the villages through which they passed. They were entrusted with many delicate missions and valuable packages, and seldom betrayed the confidence reposed in them."[22]

CANAL BOAT DAYS

Stage coaches continued to rule the transportation world until supplanted by railroads. About 1820 some enthusiasts prophesied that canal boats would give them stiff competition, but this was not the case; they were too slow and did not operate in winter. Occasionally passengers took the stage during the day and a packet boat at night, in order to get a good night's sleep. By 1850 most stage coaches had disappeared from the highways.

Canals were used mainly for freight, not passenger, transportation. Canal boat passenger travel was brief—mainly between 1820 and 1835. It was restful; there was no noise, smoke, sparks—and no hurry. The upper deck was open; passengers spent most of the time there, leisurely viewing the green hills and fertile farms through which they glided. They went below deck to eat, and to sleep in narrow berths arranged in tiers on each side, three high.

To those of a placid disposition canal boat travel was a pleasurable experience. N. P. Willis was one of these fortunate souls. He says, "Of all the modes of travel in America the least popular—and the most delightful to my way of thinking—is traveling on the canal. The packet boats are long drawing rooms where one dines, sleeps, reads, lolls or looks out the window; and if in want of exercise may at any time get a quick walk on the tow-path; and all this without perceptible motion, jar or sound. . . . Contrast this peaceful mode of travel with a journey over a railroad at a pace of fifteen miles an hour!"[23] To which a less placid contemporary retorted, "Let us leave our friends in the packet to the enjoyment of their bilge-water and mosquitoes and to all the comforts of narrow berths, crying babies and the chances of suffocation, enjoyments which a shower of rain is sure to greatly enhance."

The packet canal boat, "for fast passenger travel," was of light construction. It was pulled by three horses, which were changed frequently. It was much faster than a regular canal boat, which had freight amidships with passengers in bow and stern and was towed by two horses. Packets were first used on the Pennsylvania Canal in 1835.

Packet boat canal travel was for some little time especially popular on the Juniata. U. P. Jones, whose boyhood days were enlivened by the arrival and departure of these inland leviathans, recalled them with pleasure: "The completion of the canal was a great event. The enthusiasm of the people could scarcely be kept within bounds when the ponderous boats commenced plowing the ditch. A paper printed in Lewistown on November 5, 1829, reported, 'The boat was drawn by two white horses, and she sets off in fine style, with the star-spangled banner flying at her head, amid the roaring of cannon, the shouts of the populace and the cheering music of the band which was on board'. . . .

"For eighteen years, with the exception of the winter months, the canal packet held sway in the Juniata Valley, carrying an average of about thirty passengers a day from the East to the West and *vice versa*. . . . Who among us that has arrived at the age of manhood does not recollect the packet boat, with its motley array of passengers, its snail pace, its consequential captain and its non-communicative steersman, who used to wake the echoes with the 'to-to-to-to-toit' of his everlasting horn, and his hoarse cry, 'lock ready' ! . . . Right well do we remember, too, how contentedly people sat beneath the scorching rays of a broiling sun upon the packet as it dragged its slow length along the sinuous windings of the canal at an average speed of three and a half or four miles an hour."[24]

EARLY RAILROADS

The first of the early American locomotives, about 1832, were about twelve feet long, wood-burning and had very tall smoke stacks. Behind the engine was a small, flat car which carried piles of wood and barrels of water and a "brigade" of three to six small passenger cars, much like stage coaches. They were entered at the side; when the train was in motion it was not possible to pass from one coach to another. Each coach carried sixteen passengers.

Trains did not run after dark for the locomotive had no headlight. The wood-burning engine emitted great clouds of sparks and cinders which set fire to forests and fields, burnt holes in the clothing of passengers and sometimes ignited the coaches. The train attained a speed of ten to fifteen miles an hour. The time of arrival and departure of trains was a matter of conjecture; not until after 1850 were timetables taken seriously.

Philip Nichlin describes the mingled comforts and discomforts of his trip on the Columbia and Philadelphia Railroad on July 31, 1835: "There were in the car about twenty people . . . of whom one was an old gentleman with a red nose who was fully occupied in parrying from his ignitable proboscis the dangerous sparks emitted by the engine, which constantly flitted like fireflies in every direction through the car. . . . The journey to Columbia (eighty miles) consumed seven or eight hours. . . . In passing through a viaduct the upper part of the pointed chimney of the engine is turned down, which allows the whole train to be enveloped in a dense and noisome cloud of smoke and cinders. . . . But our day's ride was very pleasant, as we soon found that the smoky ordeals could be passed without damage by shutting our mouths and eyes and holding our noses and tongues."[25]

A. K. McClure, in his "Old-time Notes of Pennsylvania," recorded the enthusiasm of country people when the iron steed first pranced down the two-railed pike: "When the first train passed over the Pennsylvania Railroad up the Susquehanna and Juniata to Lewistown, I resided in the Juniata Valley. I could not forget what was the greatest occasion of a century, when the first song of the iron horse was heard at Mifflin station. The country people were out by thousands to see the railroad train, to which nearly all were entire strangers. A dense mass was packed in the little level close to the road and the high hills close by the western side were literally covered with intensely anxious and wildly enthusiastic people. The shriek of the locomotive announced its coming when within a mile or two of the station. The whole audience moved as if electrified; and when the train came into the station with a majestic sweep deafening shouts responded to the weird cry of the engine."[26] Similar scenes were enacted at each stopping point.

Those who had experienced the fatigue and discomforts of stage coach travel eagerly availed themselves of this easier, quicker and cheaper mode of transportation. Improvements in facilities came rapidly. By 1845 coal had supplanted wood as fuel and the stage coach type of cars had been replaced by cars entered at the end and having double seats on each side of a central aisle. Steel rails replaced wooden rails reinforced with strips of iron. The shriek of the locomotive, echoing and re-echoing from Pennsylvania hills, was the death knell of the stage coach and the canal.

INNS AND TAVERNS

Before the coming of turnpikes, stage coaches and taverns, travel was mostly by horseback. The necessity of finding shelter for the night overtook many a traveler weary from a long day in the saddle and far from a settlement. There was no recourse except to seek the hospitality of a home. Usually this was extended without question and without charge. The food might be only corn pones, salt pork and gravy, and the bed only a pallet spread on the floor before the fireplace; but in the morning the traveler was refreshed in spirit if not in body, for he had experienced genuine hospitality. In 1787 Mrs. Mary Dewees of Philadelphia traveled through western Pennsylvania. She recorded in her diary, "We were obliged to put up at a one-room Cabin . . . perhaps a dozen logs upon one another, with a few slabs for a roof and the earth for a floor. . . . The people were very kind, but amazingly dirty. There were between twenty and thirty of us; all lay on the floor except Mrs. Rees, the children and your Maria, who were favored with a bed."[27]

It was, of course, natural and inevitable that some pioneer cabin homes to which wayfarers turned should be not only dirty but also infested with vermin. The experience of Frederick A. C. Muhlenberg on a trip to the Shamokin region in 1771 was not unusual: "Let any one imagine, if he can, how he would feel if some twenty-odd people, besides cats and dogs, were to occupy a space twenty feet square for a sleeping apartment. . . . Being very tired I fell asleep and did not waken before the break of day. But I was greatly frightened when I saw and felt countless insects upon me. I arose in haste, took a clean shirt, went into the woods several yards and put it on. The other shirt I washed, for I could not tell whether it was white or black so full it was of insects. There are many nationalities and races among these insects, and none have remained away. I believe that I had several dozen of every tribe, who had come to welcome me as a stranger."[28]

As roads were improved and the number of travelers increased they were no longer forced to seek the hospitality of homes; they put up for the night at inns or taverns. In Pennsylvania these two terms were used interchangeably. Licenses for operating inns were granted by provincial, later by state, authorities. County courts were expected to determine the number to be licensed in a county and to fix their rates. During colonial days Pennsylvania had more inns than any other colony. After 1800, when turnpikes multiplied and travel likewise, the number of inns increased greatly; at one time there were sixty-two between Philadelphia and Lancaster, an average of one to a mile.

Every inn had its peculiar characteristics, social standing and reputation; these were derived mainly from the personality of "mine host." Differentiation in the patronage of inns developed along social lines. A gentleman alighting from a stage coach rarely slept under the same roof with a wagoner.

There were at least four types of inns, based on the social status of those who frequented them. "Stage stands," which catered to stage coach travelers, were at the top of the social ladder; usually teams were changed at these inns. A great gulf separated them from "wagon stands," which were patronized only by wagoners, who slept on bags of hay or oats spread on the taproom floor. "Even as late as 1845," says Theodore W. Bean of Montgomery County, "it was a common thing to see teamsters and farmers take their beds along and lodge on the floor. . . . I have frequently seen as many as one hundred lie down, respectively, at the "Red Lion" and "Black Horse."

Still lower in social standing were "drove stands" for the accommodation of drovers; these had lots into which livestock could be turned and fed. The lowest type of inn was the "tap-house," income from which was derived mainly from the sale of liquor. It gave shelter to those who would not be received at other taverns.

Many colonial inns were most uninviting—cold and dirty in winter, hot and dirty in summer. They harbored swarms of flies and mosquitoes and often other vermin. A traveler from Bethlehem to Reading in 1773 recorded in his diary, "It was the dirtiest House, without exception, in the Province, every room swarming with Buggs. . . . If I did not pray all Night, I surely watched, as Sleep was entirely banished from my Eyes; tho I enclosed myself in a Circle of Candle grease it did not save me from their devourations."[29] Another harassed traveler wrote, "The bugs made a heartier meal on me than I did on my bacon and eggs."

Tavern bedrooms usually were shared by several people, often strangers, and not infrequently of both sexes; there was no such thing as a private room. Travelers did not undress except to remove shoes, coats and hats. Sometimes there were six or eight beds in one room. The posted "Rules" of a tavern often included, "No boots to be worn in bed," and "No more than five to sleep in one bed."

Food was plentiful but often very poorly cooked. The fare at inns having English or Scotch-Irish proprietors was likely to be fried ham, corn beef and cabbage, mutton, beef stew, mush and molasses. German inns served such mouth-watering dishes as *kalbskopf* (mock turtle soup), *schmorbraten* (beef a-la-mode), *spanferkel* (stuffed and roasted suckling pig), *hammelsbraten* (roast mutton), *kuttlefleck* (spiced soused tripe), *hinkel pie* (chicken pot pie), *apfelklöse* (apple dumplings), *bratwurst* (sausage).

Full enjoyment of these savory dishes was likely to be prevented by sundry untoward circumstances. The sour odors of the taproom and the even more penetrating odors of the out-of-doors privy and the barnyard mingled at the dinner table in unsavory aroma. From the great taproom down stairs raucous laughter and ribald jokes—"not proper to be related by a female pen," as one disillusioned woman traveler expressed it—assaulted the ears of guests far into the night.

Colonial inns were commonly built of stone; many of these venerable hostels still stand. Signboards were a distinguishing feature of all inns. These were painted and were very ornate. Often they carried no name but merely a significant pictorial device, as "Green Tree Inn," "Black Horse Inn," "Sheaf of Wheat," "Black Bear," "Red Lion," "Spread Eagle," "King of Prussia," "St. George and the Dragon". Since many travelers could not read they stopped at an inn having a certain sign.

From 1700 to the Revolution the customary charge at inns was seventy-five cents to $1.00 per day. For this the guest received lodging, three meals, a fire in winter and as much beer or ale as he was inclined to drink. In severe winters travelers might be snowbound at a country inn for several days; these were enlivened by dancing and drinking.

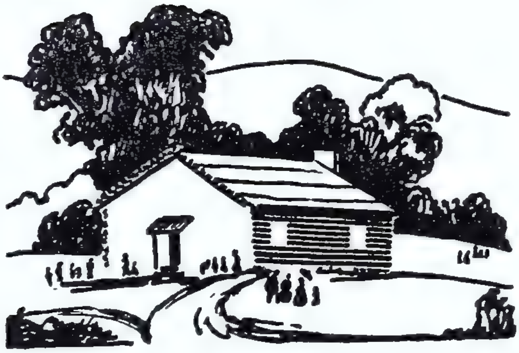
F. Cuming, an Englishman who traveled the western country through Bedford in 1807, described the tavern in that frontier village: "The scene in the tavern was, to me, truly novel. It was a large, half-finished log house, with no apparent accommodations for any traveler who had not his own bed and blanket. It was surrounded on the outside by wagons and horses; and inside the whole floor was so filled with people sleeping, wrapped in their blankets round a large fire, that there was no such thing as approaching it to get warm until some of the travelers who had awoke at our entrance went out to feed their horses, after doing which they returned, drank whiskey under the name of bitters, and resumed their beds on the floor—singing, laughing, joking, romping and apparently as happy as possible."[30]

Service at country inns often was very indifferent until the traveler had satisfied the curiosity of his host as to vital statistics, business, home and destination. It is related that Benjamin Franklin was accustomed, on arriving at an inn, to assemble the innkeeper and all his family and servants, and address them after this fashion: "Worthy people, I am Benjamin Franklin of Philadelphia, by trade a printer, and a bachelor. I have some relatives in Boston to whom I am going to make a visit. My stay will be short and I shall then return and follow my business, as a prudent man ought to. This is all I know of myself and all I can possibly inform you of. I beg, therefore, that you will have pity on me and my horse and give us both refreshment."[31]

With the coming of railroads, after 1840, most inns gradually passed out of existence. A few of the better ones, especially those near towns, became hotels. Some fine old inns, renovated and modernized, now give service to travelers arriving by automobile. But the stage coaches which once drew up at their doors, with a great cracking of whips and blowing of horns, are no more.

Sign of the King-of-Prussia Inn.

XX



THE RURAL SCHOOL

THE ONE-ROOM rural school has moulded the character of country people second only to the country church. Provincial Pennsylvania did not lead the other colonies in education, as it did in agriculture, although certain elements of her population, especially the Scotch-Irish and Quakers, made notable contributions. The present high standard of the public schools of Pennsylvania was won only after many years of conflict, often against intense opposition.

Early Colonial Schools

As early as the year 1640, forty-two years before the coming of William Penn, the good ship *Fredenberg* sailed from Europe to establish the colony of New Sweden. The founders were charged by the Swedish Crown: "The patrons . . . shall be obliged to support at all times as many ministers and schoolmasters as the number of inhabitants shall seem to require." There is no record that a schoolhouse was built but some teaching may have been done in the churches at Christina and Tinicum and in homes.

The first mention of a schoolmaster was in 1656, when the colony was under the control of the Dutch and was known as New Amstel. He was Evert Pietesen, a Hollander who "had passed a good examination before the Classics." He was employed by the colonial government to act as Schoolmaster and *ziekentrooster* [comforter of the sick], to read God's Word and to lead the singing upon the arrival of a clergyman." On August 10, 1657, he wrote from Fort Amstel, "I already begin to keep school and have 25 children."[1]

There must have been, a little later, a number of schoolmasters who traveled from home to home. The records of Upland Court show that on March 22, 1679, Edmund Draughton sued Duncan Williams for 200 guilders as wages for teaching Williams' children to read the Bible. The teacher won the suit.

William Penn was a staunch advocate of education for all people. He wrote to a friend, "If we would preserve our government we must educate our people. The government is a trustee for the youth." In March, 1683, at his suggestion, the Assembly adopted the Second Frame of Government, or Great Law, which included this provision: "To the End that Poor as well as Rich may be instructed in good and Commendable learning, Which is to be prefered before wealth, *Be it &c.*, that all persons in this Province and territories thereof, having Children, and all the Guardians or Trustees of Orphans, shall cause such to be instructed in Reading and Writing; so that they may be able to read the Scriptures; and to write by the time they attain to twelve years of age."[2]

It was further provided, "The Governor and Provincial Council shall erect and order all public schools." One such school was established in Philadelphia. At a meeting of the Council on December 26, 1683 at which William Penn was present it was ordered, "The Gov^r and Provi^n Councill, having taken into their Serious Consideration and the great Necessity there is of a School Master for y^e Instruction & Sober Education of Youth. . . . has secured one to whom pupils could be sent upon the following terms; to Learne to read English, 4 s. by y^e quarter; to Learne to read and write, 6 s. by y^e Quarter; to Learne to read, write and cast accot [accounts], 8 s. by y^e Quarter; for Boarding a Scholler, that is to say, dyet, Washing, Lodging & Scholling, Tenn pounds for one whole Year."[3] Enoch Flower was employed as schoolmaster. This initial venture in public elementary education was short lived; the school was discontinued in 1689.

Thomas Budd, an English Quaker who settled at Burlington, N. J. in 1678 and moved to Philadelphia in 1686, strongly supported Penn's democratic educational program. 1685 he wrote, "Now it might be well if a Law were made by the Governours and General Assemblies of Pennsylvania and New Jersey that all Persons inhabiting in the said Provinces do put their Children seven years to the publick School, or longer if the Parents please."[4] His counsel fell on deaf ears.

The point of view of William Penn and Thomas Budd—that provision for education of youth is one of the primary obligations of government—was far in advance of their time and found little support. The provincial charter of 1701 contained no provision whatever relative to education. This was due mainly to the national and religious antagonisms that sharply divided the province and made a unified public school system impossible of attainment. Religious groups gradually took over the responsibility of providing education. On May 28, 1715, the General

Assembly passed acts authorizing these groups to establish and conduct schools; this was confirmed by the act of February 6, 1731.[5]

In the first three-quarters of the eighteenth century nothing was done by government to provide means for education. Nearly two centuries elapsed before William Penn's compulsory school program of 1683 was made effective. The result was bitter wrangling between opposing advocates of church and public education and accentuation of national and religious jealousies.

William Penn advocated vocational education patterned after the apprentice system of England. His Frame of Government provided, "All children within this Province of the age of twelve years shall be taught some useful trade or skill, that the poor may work to live and the rich, if they become poor, may not want." Parents who failed to do this were to be fined five pounds for each child so neglected. Thomas Budd earnestly supported this policy. In 1685 he urged that boys and girls be trained in all the most useful arts and sciences and in trades and home industries; and that children of the poor be so trained free of charge. Not until many years later were these educational ideals realized fully, but the apprentice system established by Penn was the means of giving vocational training to thousands of boys and girls, most of them children of the poor. The masters and mistresses of apprentices were required by law to give them a specified amount of schooling.

By far the most outstanding early Pennsylvania schoolmasters were Francis Daniel Pastorius and Christopher Dock. Pastorius, founder of Germantown, taught in the Friends' Public School of Philadelphia from 1698 to 1700 and later was in charge of the first German school in Pennsylvania, at Germantown. Like the Quaker school, this was supported by fees and contributions. It had two novel features—coeducation, and a night school for those who worked during the day or who were too old to be admitted to the day school.

Christopher Dock, "the pious Schoolmaster on the Skippack," Montgomery County, was a Mennonite. He was a farmer as well as a schoolmaster. For more than half a century, from 1714 to 1771, his school was an educational beacon. At a time when most schoolmasters ruled their pupils by the law of force he ruled his by the law of love. In 1750 he completed his *Schul-ordnung,* the first pedagogical work to be published in America; it was printed by Christopher Sauer of Germantown in 1770.

CHURCH SCHOOLS

For more than a century after the founding of the colony practically all schools were established and operated by religious groups. It was the hope of each national group and religious sect to perpetuate in the New World the language, customs and faith of their fathers. To this end, some of them resisted all assimilative influences. A few groups, notably German sectarians, sincerely believed that education beyond the elementary branches led to "worldliness" and should be discouraged. They desired that their children should learn to read the Scriptures, write a letter and cast up simple accounts—but no more. They desired, most of all, that instruction in the tenets of their own religious faith be the central feature of the school curriculum and that schools be conducted primarily to indoctrinate children in that faith. This point of view dominated elementary education in Pennsylvania for more than a century. Had it not been for church schools, however, gross ignorance would have prevailed.

The first so-called "public school" in Pennsylvania—it was really a church school—was opened in 1689 and was chartered by William Penn in 1692. This was the Friends' Public School of Philadelphia, now known as the William Penn Charter School. It was open to all children; parents who possessed means paid tuition but the poor were not required to do so. George Keith, the central figure in the Quaker theological schism, was the first master.

Quakers established many other schools, mainly in connection with their Meeting houses. In all of them children of the poor were admitted with little if any charge; the schools were supported by tuition and subscriptions. Since Quakers, in general, had more means than other religious groups, their schools were well supported. Teachers were selected with great care from their own number. Following the traditional policy of Friends with respect to equality of the sexes, many teachers were women. Prior to 1800 there were no better rural schools in America than those established by Quakers in southeastern Pennsylvania.

A few church schools were established by English-speaking religious groups other than Quakers and Scotch-Irish Presbyterians, especially by Episcopalians. The founding of Christ Church in Philadelphia in 1695 by Episcopalians was accompanied by the organization of a church school. In 1684 the Baptists built their first church, at Cold Springs, Bucks County; this denomination established several church schools in the southeastern counties. A school was attached to the first Roman Catholic church in Pennsylvania, that of St. Joseph, in Philadelphia, which was established in 1730.

Of all national and religious groups, the Pennsylvania Germans were most strongly opposed to schools under the jurisdiction of government, fearing that they might become an irreligious instrument for political control. They had been accustomed to parochial schools in the fatherland. There the schoolmaster was an officer of the church; he assisted the minister in church services and taught children the catechism. This was true of Lutheran and Reformed churches as well as of German sectarians.

Following in the footsteps of Pastorius and Christopher Dock, church schools were established in nearly every German-speaking community. The educational standards, however, were not high. Many teachers were poorly trained. Most German sectarians held firmly to the belief that a knowledge of the Bible and of the soil constituted the only true basis of education, hence many desired that their children should have only the bare essentials of schooling. The Lutheran and Reformed churches, however, strongly supported more advanced education. In response to their appeal, Henry Melchior Muhlenberg came from Germany and established many church schools which provided education beyond the elementary branches. The Moravians, also, were zealous in education; the first Moravian school in America, a boarding school, was opened at Germantown in 1742 and another at Bethlehem in 1745.

The "Rules and Regulations" of a German church school at Tulpehocken in 1744 indicate the low standards of most schools at that time:

"The text book for the study of language [German] is the Primer and Reader issued by the University of Jena.

"Advanced readers are to use the Bible.

"Writing is to be taught.

"The reading of the same.

"As much arithmetic is to be taught as is necessary for a *Plantage Mann* [manager of a farm]."[6]

The will of a Lancaster County farmer dated January 1, 1748 enjoins his widow: "To keep my two sons, Andrew and Joseph, and put them to School during her Widdowhood or till they can Read the Bible plain, and Read and Write Bills and Bonds, and Work the Golden Rule in Arithmatick Perfect. My daughters must learn to Read the Bible plain and to knit and make theer own stockins."[7]

By about 1750 Germans comprised nearly half the population of the province. A much larger proportion of them were illiterate than any other group. The life of most pioneer German farmers was too arduously devoted to the soil to permit them to think much of giving their children an education, even had they so desired; consequently the first generation born on Pennsylvania soil had considerably less schooling than their fathers had received in Germany. Illiteracy in Pennsylvania was at its peak about the middle of the eighteenth century.

Schools in German communities were conducted in German. Until after 1800 a large proportion of German farmers and their families could not speak English. Because of the numerical preponderance of Germans Benjamin Franklin and other political leaders became fearful that eventually German, not English, might become the official language of the Province and that control of the government would pass into the hands of Germans. In 1754 it was proposed in the General Assembly "that the government should suspend the right of the Germans to vote for the members of the Assembly until they had acquired a competent knowledge of the English language."[8]

The "Society for Propagating Christian Knowledge Among the Germans of America" was organized in London in 1754. Rev. Michael Schlatter, a minister of the Reformed Church who came to Pennsylvania in 1746, and William Smith, first Provost of the institution now known as the University of Pennsylvania, were the chief promoters. A fund of $20,000 was raised to support English-speaking schools among Pennsylvania Germans. Benjamin Franklin was one of six trustees of the fund. Eight schools were established. Instruction was given in both English and German and there was no tuition.

A few members of the Lutheran and Reformed churches embraced this opportunity to broaden the intellectual horizon of their children, but the enterprise was bitterly opposed by Christopher Sauer and other influential German sectarians. They considered it not only a reflection on the German way of life but also were fearful that the plan, if successful, would put an end to church schools and lead to political domination of the education of youth. The eight schools were poorly attended by the intended beneficiaries and soon languished. In 1763 outside financial support was withdrawn and they became German church schools.

The *Reformed Coetus* of 1757 succintly states the German point of view: "With regard to the schools, we can do little to promote them, since the directors try to erect nothing but English schools and care nothing for the German language. Hence, now as before, the Germans themselves ought to look out for their schools, in which their children may be instructed in German." This they did until 1834, with no organized interference from the state. At that time the Lutheran church was maintaining about 250 schools, the Reformed church about 160, and the sectarians about 150.

Early Scotch-Irish settlers in Pennsylvania were more active in the support of education than any other group. This interest was a heritage from Europe. In 1695 the Scottish Parliament passed an act providing that "there be a school founded and a schoolmaster appointed in every parish, by advice of the Presbyteries." Settlers from Ulster had been accustomed to public education supported by taxation but controlled by the Church. Scotch-Irish were barely settled in their new home before they began to build churches and church schools. They were firmly convinced of the need for an educated ministry and for the education of all children as far as means permitted.

Since Scotch-Irish were mostly on the sparsely settled frontier, prodigious efforts were required to found and maintain schools. Instruction was given in reading, writing, spelling, arithmetic and religion. The Bible was read every day and the Shorter Catechism recited by all pupils at least once a week. The most noted Presbyterian church schools were the classical academy established by the Rev. William Tennent in Bucks County in 1726, popularly called "The Log College"; and the classical school established at New London, Chester County, in 1741 by Rev. Francis Alison.

NEIGHBORHOOD SCHOOLS

As settlement advanced into remote parts of the province, church schools were found to be inadequate. In some sparsely settled districts there were no churches, or they were so weak that it was not practicable to attempt to organize schools in connection with them. Furthermore, from the beginning of the colony there were many who were opposed to church schools, believing that provision for the education of youth was a responsibility of government and that schools should be free from sectarian control. Neighborhood schools developed out of these conditions.

The simplest kind of neighborhood school was the kind that was held in a home. The teacher was a mother; the pupils were her children and those of her neighbors. In most parts of the province the first schools were of this type. Henry B. Plumb describes the organization of a home school in the Wyoming Valley about 1780:

"Some one who was engaged in teaching her own children at home would announce to her neighbors that she would take a class at certain hours of the day at her own home, to teach certain branches. . . . The boys went to read, write and cipher; the girls to learn domestic arts, also. Money of any kind was so little in circulation that all pay was 'in kind,' that is, some product of the farm or household. Everyone furnished his own schoolbooks—they were something that could not be made by the father of the family at home; often the books used by the father were used by his children and even his grandchildren."[9]

Following is a bill for schooling at Birchrunville School, West Vincent Township, Chester County, in 1836:

Mr. Abraham Titlow to Patrick Doyle, Dr.

For 42 days tuition, due Feb. 22, 1836	$1.16⅔
To fuel expense	.15⅓
To stove rent	.04
	$1.36

This was a private school conducted by a pedagogue who was noted more for the number and soundness of the floggings that he administered than for the learning that he imparted.

The next step in school organization for most communities was the subscription school; this began to appear about 1750. The first school west of the Alleghenies, established at Pittsburgh in 1759, was of this type. A visitor to that frontier village recorded in his journal for

December 1, 1759, "Many of y^{e} Inhabitants have here hired a School Master & subscrib^{d} above Sixty Pounds for this year to him; he has about Twenty Schollars."[10]

The record of the organization of a subscription school in Fayette County in 1811 indicates the usual procedure: "We whose names are hereunto subscribed do agree to employ William Scott, Jr., for a term of five months commencing the 4 th. day of November, 1811, for the purpose of teaching the scholars we shall entrust to his care the rules of spelling, writing and arithmetic, as far as his ability and their capacity will admit of in that time, at the rate of $2.50 each scholar, payable one half in cash, the other half in merchantable wheat, rye, corn or bar iron at market price. . . . And further, we agree to meet at the schoolhouse before the commencement of the school and appoint three suitable persons as Trustees, whose duty it shall be to see that the school house be put and kept in good repair and sufficiency of firing."[11] Then follows a list of the subscribers and the number of pupils which each subscriber proposed to send to school.

The usual tuition was $1.00 or $1.25 per pupil for a three months' term. Sometimes it was difficult or impossible to collect even this small amount and the schoolmaster, being destitute, would depart in midterm for a more promising field. Children of the poor were admitted to subscription schools free, but those who could afford to pay anything at all were required to do so. School trustees were elected at an annual meeting of the patrons. A rude log schoolhouse was "rolled up" by the subscribers at no expense except their labor for a day; the site was donated.

After the Revolution many hundreds of subscription schools were thus established through the cooperation of neighbors. In sparsely populated districts they far outnumbered church schools, but they were less numerous in the southeastern counties. Most subscription schools developed from voluntary community action, but some were promoted by schoolmasters who wandered into settlements seeking employment.

Although many subscription schools were poorly equipped and the quality of teaching was, in general, inferior to that of church schools, nevertheless they met the needs of the times fairly well. They were democratic, being organized and conducted according to the ideas and wishes of the community, with no outside influence or control whatever. They were the forerunners of the common school system of today.

EVOLUTION OF THE COMMON SCHOOL SYSTEM

In spite of denominational efforts to meet educational needs and the development of numerous neighborhood schools, conditions were far from satisfactory, especially in rural communities. Many children of the poor did not attend school at all, or very irregularly. Some parents bound out their children, as apprentices or servants, on condition that they be given a specified amount of schooling. Instruction in both church and neighborhood schools was not only very elementary but also variable in efficiency. Only children of the well-to-do had the advantage of a good education. Illiteracy was high. Church and neighborhood schools, while serviceable, failed to provide the opportunity for education that citizens of the republic had a right to expect.

Years passed without much progress. After the untimely demise of William Penn's far-seeing program of public education, little interest was shown in public schools for more than a century. The first constitution, in 1776, provided, "A school or schools shall be established in each county by the Legislature for the convenient instruction of youth, with such salaries to the masters paid by the Public, as may enable them to instruct youth at low prices"; and "all useful learning shall be duly encouraged and promoted in one or more universities." An act of 1786 set aside 60,000 acres of public land for the endowment of public schools; ultimately these lands were appropriated to the support of county academies.

In 1786 Dr. Benjamin Rush of Philadelphia submitted to the Legislature a plan for public education which provided for: (1) One state university, at Philadelphia. (2) Four state colleges, at Philadelphia, Lancaster, Carlisle and Pittsburgh. (3) Free public schools in every township, supported by taxation, where youth would be "taught to read and write the English and German languages and the use of figures."[12] Nothing came of this proposal, at least immediately.

The constitution of 1790 authorized "the establishment of schools throughout the state in such manner that the poor may be taught *gratis"*; and specified, "The arts and sciences shall be promoted in one or more seminaries of learning." No steps were taken to carry these provisions into effect. In 1800 George Logan proposed to the General Assembly that it establish a public school system and secularize all schools. The bill was opposed by supporters of church schools and failed of passage.

The first act of the Pennsylvania Legislature looking toward tax-supported education for all youth was approved March 1, 1802, but the law was defective and became inoperative. The first effective step by the state to develop a common school system was in 1809, when the provision of the constitution of 1790, for schools in which "the poor may be taught *gratis*," was made reality. County assessors were required to compile the names of all children between the ages of five and twelve years whose parents were unable to pay for their schooling; these were to be sent to any school in the neighborhood and the expense paid from public tax money.

Following is a bill presented to the county commissioners of Centre County for tuition of children of the poor under the law of 1809:[13]

"Walker Township, Nov. 29, 1810.

Centre County, Dr. to Robert McBride, Schoolmaster:
To the tuition of James and Kitty Ekin, Samuel and Jane Young, poor children, viz:

"James Ekin, 56 days at 3 cents P. D.	$1.68
Kitty Ekin, 56 days at 3 cents P. D.	1.68
Samuel Young, 40 days at 3 cents P. D.	1.20
Jane Young, 37 days at 3 cents P. D.	1.11
To ½ quire of paper for Jane Young	.15½
Total Amount	$5.82½

"That the above-mentioned poor children are learning to spell, read and write the English with Robert McBride is hereby certified by

John McCalmont
Wm. Smith"

In 1824 the law of 1809 was superseded by an act which provided that every township should elect three "schoolmen" to "supervise the education of the poor" and "cause them to be instructed as other children are treated, the expense of tuition to be paid by the county." School trustees were authorized to establish new schools, if necessary, at county expense, to which all children between the ages of six and fourteen were to be sent for three years. This act was repealed in 1826 and the act of 1809 revived.

The "pauper school law," as it was called, remained on the statute books until 1834. It was the subject of bitter controversy and the cause of many personal and political feuds. Prosperous farmers were opposed to it because they paid the taxes which supported children of the poor in schools. The poor were opposed to it because they were expected to brand themselves with the stigma of pauperism. Most of them refused to send their children to school under these conditions; illiteracy mounted high. Education remained mainly a luxury for children of the well-to-do.

While the act of 1809 failed to meet the purpose for which it was intended, it did stimulate discussion of the need for common schools open to all children, rich and poor alike, and supported by taxation. This discussion eventuated in the act of 1834, which provided "a general system of education by common schools." The act of April 2, 1831, which set aside certain public monies from the sales of state-owned land and from other cources to be distributed throughout the state for the support of common schools was a step in this direction.

The act of April 1, 1834, the so-called School Law, as amended in 1836, was the foundation of the present common school system of Pennsylvania. It was the fifth major step in the evolution of schools, the other four being home schools, church schools, subscription schools and "pauper schools." The need for it was great. In 1835 an English visitor, Edward S. Abdy, observed that Pennsylvania had done less for the education of her people than many other states, although then the wealthiest and most populous state in the Union. This was due, he said, not only to the entrenched position of church schools but also to the high price paid for child labor in factories.[14]

In his message to the General Assembly in 1831 Governor George Wolf stated that of 400,000 children of legal school age in Pennsylvania only 150,000 were in schools. He recommended that immediate steps be taken to remedy this deplorable situation; school improvement was the central purpose of his administration.

The school law of 1834 declared that education of the people is enjoined by the Constitution of the United States and is a solemn duty of Government which cannot be safely neglected without danger to the welfare of the republic. The legislative committee which reported the act made this comment on the school law of 1809: "Your committee have taken care to exclude the word 'poor' from the bill . . . and to form an educational association between the rich, the comparatively rich and the destitute. Let them all fare alike in the primary school, receive the same elementary instruction and imbibe the republican spirit. In after life, he who is diligent at school will take his station accordingly, whether born to wealth or not."

The act provided for the elementary or common school education of all youth in the Commonwealth and for state appropriations to support these schools, to be supplemented by money raised locally by taxation. It stated, "The city and County of Philadelphia and every other county in this Commonwealth shall each form a school division; and every ward, township and borough within the several school divisions shall each form a school district." The schools were to be supervised by locally elected school directors, as in subscription schools.

The act stipulated that its provisions should not become operative in a school district until the citizens of that district had adopted it by majority vote; the law was optional, not mandatory. The supplemental act of April 15, 1835 specified more definitely, "Where any township or district in any school division votes in the negative on the question of accepting the law to which this is a supplement, said township or district shall not be compelled to accept the same."

The epochal school law of 1834, the foundation of public schools, was largely the result of pressure brought to bear on the legislature by farmers and representatives of labor, as well as by a few educational and political leaders. In 1827 the Pennsylvania Society for the Promotion of Public Schools was organized in Philadelphia; it did much to arouse the public on this issue. There was wide-spread dissatisfaction in rural districts with the meager educational opportunities for farm youth. This was especially true in central and western counties which were predominantly Scotch-Irish.

The educational revolt among farmers found staunch support among the rapidly increasing number of workers in industries. At a meeting of industrial workers held in Philadelphia in 1830, labor demanded a state system of common schools and resolved, "Until means of equal opportunity for instruction shall be secured to all, liberty is but an unmeaning word and equality an empty shadow. . . . The cardinal principles of republican liberty which were declared in 1776 . . . can only be sustained by the adoption of an ample system of public instruction calculated to impart equality as well as mental culture . . . where the children of the poor and the rich may meet at that period of life when the pomp and circumstance of wealth have not engendered pride. . . . Poverty is not a crime, neither is wealth a virtue."[15]

Opposition to the Common School Law

The act of 1834 was warmly welcomed in communities which had subscription schools. Nearly half the school districts of the state promptly voted to come under the provisions of the act. By 1837 it had been accepted by 742 of the 987 districts. It was favorably received in northern and western counties but met opposition in parts of southeastern and central Pennsylvania, especially in districts that were preponderantly German. It was rejected or ignored by 30 of the 36 school districts of Berks County, 11 of the 14 districts of Lehigh County, 12 of the 14 districts of Union County, and all of the nine districts of Lebanon County.

The opposition came mostly from supporters of German church schools, mainly Mennonites, and to a lesser degree Reformed and Lutheran congregations. Objection was raised, also, by some Quaker and Episcopalian supporters of church schools. It was the contention of these religionists that the law would remove their children from instruction in their own faith. To them, this seemed not only irreligious but a blow at personal liberty. The opposition also included some proprietors of private schools, large tax-payers and conservatives in general to whom the old order was "good enough."

The controversy reached the boiling point in 1836. It was thought that a majority of the members of the Legislature had been pledged to repeal the act. Petitions urging repeal, carrying the signatures of 32,000 citizens, were presented to the lawmakers. In response to this pressure the Senate passed a substitute bill which made provision only for the education of the poor *gratis,* as in the act of 1809, but this was defeated in the House mainly through the powerful influence of Governor Wolf and Thaddeus Stevens. The ringing speech of Stevens, "In

Defense of the Pennsylvania Free School Systems" won over a hostile legislature. The fight for common schools was won.

Even so, many districts did not subscribe to the provisions of the act of 1834 until after the passage of the act of April 1, 1848. This made acceptance of the act of 1834 mandatory instead of optional. It provided, "The common school system, from and after the passage of this act, shall be deemed held and taken to be adopted by the school districts of the Commonwealth."

This action threw Amish and other sincere opponents of common schools into a ferment. They considered that the legislature had assumed unwarranted powers and had made a wanton invasion of their sacred rights; that the term "free schools" was inappropriate, they should be called *zwinag Schulen,* (forced schools); and that it was their solemn religious duty to resist the execution of the law. This they did by instituting court actions, which invariably were unsuccessful, and by refusing to send their children to common schools.

The animosity generated by this conflict is described by Franklin Ellis of Lancaster County: "It is seldom that a more bitter and implacable resentment has been cherished by any set of men than by these baffled anti-school men. Not only were those who had actually taken part against them relentlessly proscribed and ostracised in business and social intercourse, but also others who, on account of their social position or known literary tastes were suspected of sympathizing with the cause of education. . . . Many families that had been accustomed for years to trade off their produce for store goods in their own village now passed that store to deal with other merchants miles away."[17] Common schools were established throughout the state despite this protest.

The almost united opposition of thousands of Pennsylvania Germans to the school law of 1834 was the culmination of their long fight to preserve German language, religion and customs in the New World. Many of them, especially sectarians and particularly Amish, did not desire their children to have more than elementary education. They were people of strong prejudices. They had a hearty dislike of the *Verdommt Englisher,* who reciprocated in kind and degree. A prayer in the litany used by the Lutheran church of Pennsylvania in 1786 indicates the point of view of most Germans at that time: "And since it has pleased Thee, chiefly by means of Germans, to transform this state into a blossoming garden, and the desert into a pleasant pasturage, help us not to deny our nation, but to endeavor that our youth may be so educated that German schools and churches may not only be sustained but may attain a still more flourishing condition."[18]

The dominating motive of most Germans in their opposition to common schools was religious conviction. To them, the Bible was the sole source of authority. They believed that state-controlled education would lead their children away from the Bible and the farm. This would be calamitous, for they firmly believed that the tiller of the soil, more than any other, enjoys the blessing of God.

The German point of view was stated by H. A. Muhlenberg in 1836: "The Germans of our state are not opposed to education as such but only to any system that to them seems to trench on their parental and natural rights. They still retain the German theory of education—that the child belongs first to God, then to the parents, then to the state. The chief responsibility for their education, therefore, rests on Church and parents. Their educational system is preeminently a religious one. . . . An additional reason, of course, is their attachment to their own dialect." [19]

Most Pennsylvanians of German descent now agree that these motives, though sincere, were mistaken. It must be remembered, also, that it was a German Governor, George Wolf, who was most influential in securing the adoption of the common school system.

Common schools were established in the Wyoming Valley by settlers from Connecticut more than half a century before they were operative elsewhere in the state. They were patterned after the schools of New England at that time (1773), being supported by taxation, open to all youth and subject to local control by a committee of three trustees elected at town meeting. These schools remained outside the educational system of the state until the adoption of the common school law of 1834.

SCHOOLHOUSES

Many pioneer schools were not taught in buildings erected for that purpose but in homes and churches. Little consideration was given to convenience, comfort and lighting in early schoolhouses. In Clearfield County, according to Lewis C. Aldrich, "Some schools were kept in abandoned log cabins. In fact, it appears that when a cabin was unfit for use as a habitation it was just the place for a school."

Prior to 1840 most Pennsylvania rural schoolhouses were log cabins. Says Aldrich, "The limited means of the first settlers had much, yes, all to do with the character of their schoolhouses, as they were all erected with voluntary aid. This did not take any great length of time, as the following account, written by an eye-witness, will show. He says, 'I was present one morning when the spot selected for the proposed school was cleared. That same evening I found there a full-grown schoolhouse ready for occupancy; and on the following morning the sessions of the school commenced.'" [20] Log cabin schoolhouses rarely were larger than fourteen by eighteen feet.

W. J. McKnight describes a pioneer schoolhouse in northwestern Pennsylvania: "They were round log cabins. For ceilings, poles were thrown across overhead and brush placed on these poles and covered with earth. Above this was a clapboard roof held down by weight poles.

Some of the better schoolhouses had puncheon floors; others had but the greensward, as nature left it. For light, a log was left out of the building and newspapers were greased and pasted in this opening. The seats were rude benches made of split logs. The desks were constructed by boring into logs of the wall and placing a slit piece of timber on pins driven into the holes.

"The fireplace was made of stone, mortar and sticks; it included the entire end of the building. Wood for this huge fireplace was hauled from the surrounding forests by neighbors, who would appoint a day and all turn out with oxen and sleds, and thus the wood was brought to the door and there cut in suitable lengths by the larger boys in turn. . . . These schoolhouses were built in a day." [21]

"Writers and cypherers"—the older children—faced the window with their backs to the teacher and wrote on a narrow plank which ran around the walls of the building. This was the "big bench." Small children and those who did not write sat in the middle of the room on four-legged, back-less benches made of split logs.

Since the very limited school term of two to four months almost invariably was in winter, the wood supply was a major problem. An early Dauphin County historian describes how it was met in his district: "Wood for the rural school was supplied by contributions of loads from the several families. The fathers of some testified to the opinion they had of their children by bringing fine, round loads of hickory wood to warm them, while some others brought only scanty, scraggy, ill-looking heaps of green oak, white birch or hemlock. The children were all clothed alike in homespun and the only signs of aristocracy were that some were clean and some less so. Indeed, about all the inequality among the children centered in the quality of the woodpile.

"There was no complaint in those days of the want of ventilation, for the great fireplace held a considerable fraction of a cord of wood and the windows took in just enough air to supply the combustion. Besides, the larger lads were occasionally ventilated by being sent out to cut wood enough to keep the fire in action."[22]

Even at best, log cabin schoolhouses were drafty and uncomfortable. Pupils who sat near the fireplace roasted; those who sat near the outside walls froze. Recalling his boyhood days in a Bedford County school about 1805 James Blackburn says, "The *writers* and *cypherers* did not fare so well. . . . Often have I sat beside these open windows (a log left out and the aperture covered with oiled paper, often torn) writing when the ink would freeze on our pens. We would then hold them in our mouths, blow a warm breath or two on them, and then proceed for a few words, when the same process would have to be repeated."[23]

After 1820 the primitive but distinctive round log schoolhouses were gradually replaced with larger hewn log or frame structures. These had a narrow aisle in the middle; on either side, facing the aisle, were unpainted back-less benches, each holding two pupils. Boys sat on one side of the aisle and girls on the other. Boys being boys, they surreptitiously hacked the benches with jackknives even though they knew that if the master caught them at it they would get a flogging. Fireplaces were replaced by stoves, located in the middle of the room. Some of the stoves had a capacity of nearly a quarter of a cord of wood. A few narrow sash of window glass replaced oiled paper.

About 1830 a considerable number of brick or stone octagonal schoolhouses were built in the southeastern counties, presumably on the theory that they economized space and gave the teacher better surveillance of his pupils. Some of these, and a few log schoolhouses, still stand.

Still sits the schoolhouse by the road,
A ragged beggar sunning;
Around it still the sumacs grow,
And blackberry vines a-running.

SCHOOLMASTERS

During the colonial period and for some years thereafter instructors of the young were called schoolmasters, not schoolteachers. This distinction was well drawn; the master ruled his pupils with the heavy rod of physical discipline. Until after 1800 practically all were men; only in Quaker schools and in the Wyoming Valley were women employed. After the adoption of the common school system in 1834 the number of women teachers increased. In 1842 there were 5,176 male and 2,316 female teachers in Pennsylvania.[23] "In Huntingdon County," says Moses S. Lytle, "as well as in other counties of the state, female teachers met

with violent opposition. In 1842 there were 130 male and six female teachers in this county."[24]

During the early Pennsylvania colonial days a very large proportion of the teaching was by ministers at church schools, or by their ecclesiastical assistants. Young clergymen frequently taught school while waiting for a call to a pastorate. Ministers were well qualified to give elementary instruction. Outside the ministry, however, very few men of scholarly preparation made teaching their life work and maintained the high traditions of the public schools of England. A majority of secular schoolmasters were poorly educated, incompetent ne'er-do-wells, who taught school only to keep from starving. The pay was so small that they were perennially poverty-stricken.

Except in the better church schools, schoolmasters were held in low esteem; they were far down the social scale. Usually they were unmarried and footloose; they wandered about the country in search of a living. The following advertisement appeared in a York County newspaper in 1771: *"Ran Away,* a servant man who had followed the occupation of a schoolmaster, much given to drinking and gambling. One cent reward is offered."[25]

The simple qualifications required in most communities for the position of schoolmaster were ability to read, write, "cipher," make quill pens, and maintain discipline by physical force. No certificate was required but a glib tongue. "It was the rule in Northwestern Pennsylvania," says W. J. McKnight, "for a boy who wished to have an education to attend the winter term of school at home until qualified to teach a country school; then to teach in winter and work in summer until he could save enough to attend an academy."

The low pedagogic attainments of most schoolmasters is attested by the following questions and answers prepared by one of them for the enlightenment of farmers who were charged with the duty of assessing property in Juniata County:

"Question: How do you multiply the part of any Nomber insted of the hul?

"Answer: When the multyer is such a Nomber that aney Two figers being multyplied together will make the said Multyplyer, it is shorter to multy the Given Nomber by one of these figers, and that Product by the other; as 5 times 7 is 35. You must have the Multy Ply Casion Table by hart."[26]

There was, unfortunately, little inducement for competent persons to enter the teaching profession; the compensation was ridiculously low. Moreover, it was uncertain, since schooling was subordinate to farm work. Parents might keep their children out of school at any time to help in farm work and the master was paid according to the number of days of schooling received by each child. Subscription schools in rural communities were open only two to four months a year; the compensation was rarely over $12 a month and board, or $16 a month and "find themselves." Masters regulated the length of their boarding with parents by the number of children they had in school.

In the better Quaker schools the compensation sometimes was as high as $400 a year. In 1842, according to Charles B. Trego, the average teacher's salary in Pennsylvania was $18.58 per month for male teachers and $11.16 for female teachers. Part of the compensation might be in the use of a house and farm. In 1791 the Lutheran congregation at Tulpehocken, Berks County, offered the prospective schoolmaster the use of thirty-five acres of farm land, a house, barn, and "enough meadow land to keep four head of cattle."

Early schoolmasters had other duties beside teaching. If they could play the flute or fiddle at neighborhood "raisings" and "bees," this accomplishment atoned for considerable deficiency in formal education. Usually they had to build the schoolhouse fire and sweep the floor. Teachers at church schools had additional responsibilities. Franklin Ellis comments, "Jacob Loeser, a schoolmaster in Lancaster County in 1781, was a busy man and not over-paid. In addition to teaching school he played the organ, led the singing during the regular church services and at funerals, opened and closed the church and had charge of the graveyard; for all of which he received a free dwelling in part of the schoolhouse, had the free use of part of the school lot, received ten cords of wood half being hickory, and the sum of ten pounds (about $40) a year in silver."[28]

Most schoolmasters had to eke out a meager existence by engaging in some other occupation, often farming. Not until long after 1840 were they generally recognized as members of an honorable profession and paid accordingly.

THE CURRICULUM

In most church and subscription schools instruction was limited to reading, writing, spelling and "cyphering". Reading and writing were considered most essential; less attention was given to arithmetic. "The daily program," says W. J. McKnight of Jefferson County, "was two or four reading lessons and two spelling lessons; the rest of the time was devoted to writing and doing 'sums'. It was considered useless and foolish for a girl to learn more at school than to spell, read and write. There was no uniformity of textbooks; the child took to school whatever book he had, hence there was and could be no classification of pupils."[29] Pupils varied widely in age and attainment. In some frontier schools beginners seven or eight years old were in the same class as boys or girls of eighteen or more who had no opportunity for schooling when younger.

It was a man's world in those stern days. In rural districts girls were admitted with boys to elementary instruction but were not permitted to progress beyond the three R's. In towns they could attend boarding schools for "female education," which was mainly vocational.

The subordinate position accorded to women, educationally, until long after 1840 was an expression of the masculine fallacy of considering them the "weaker sex," mentally as well as physically. An extract from the journal of Governor Winthrop of Massachusetts in 1649 indicates the prevailing masculine point of view concerning the intellectual capacity of women: "I know a goodly young woman, and of special parts, who has fallen into a sad infirmity, the loss of her understanding and reason, which has been growing on her diverse years by occasion of giving herself wholly to reading and writing. . . . For if she had attended her household affairs, and such things as belong to women, and not gone out of her way to meddle with such things as are proper for men, whose minds are stronger, she had kept her wits and might have improved them usefully and honorably in the place God had set for her."[30]

Many of the early schools had practically no textbooks to speak of, but the Bible. The only textbooks of many German schools were *Das ABC Buch, Der Psalter,* and *Das Neue Testament.* Other schools had a mixed lot of books that had been used by the parents of the pupils, perhaps in the Old World.

The spelling book that was most favored in early years was by Thomas Dilworth; it was published in Philadelphia in 1757. Twenty-one years later the ninth edition was printed. Reading lessons, fables and forms of prayers for children alternated with lessons in spelling. During the Revolution the Philadelphia edition contained lessons in grammar also; these were omitted in the Lancaster edition "until peace and commerce shall again smile upon us and when, in spite of Britain and a certain evil one surnamed Beelzebub, we shall have paper and books of every kind in abundance."

Other popular spelling books were *The United States Speller* by Beverly, the fourteenth edition of which was printed in Philadelphia in 1816; and those of Cobb, Comely and Noah Webster. Webster's speller, first published in 1783, soon displaced Dilworth's book. It was used in rural schools as late as 1880, at which time more than 62,000,000 copies had been sold. To be able to "spell down" all the best spellers of the neighborhood, either at school or at a community spelling match, was a mark of distinction.

The almost universal text in reading was the Bible, particularly the New Testament. Bunyan's *Pilgrim's Progress* was used somewhat. The first reader of many rural children was the *New England Primer.* This was published in Boston in 1689; during the century and a half in which it was used more than 6,000,000 copies were sold, many of them bearing a Philadelphia imprint. "The first book put into the hands of the Presbyterian infant," says James P. Matthews, "was the *New England Primer*. It contained the alphabet, followed by a progressive series of spelling lessons, leading up to a finely illustrated poem which proclaimed a fundamental principle of Calvinistic theology in its first couplet:

'In Adam's fall
We sinned all.'

". . . All this was merely introductory to the Shorter Catechism, which filled fourteen pages of the primer. . . . This Primer was a living, vital force in the Cumberland Valley, moulding opinion and forming character."[31] Murray's *Introduction and Reader*, and the *New England Reader* also were in favor.

Arithmetic was taught, for the most part, without the aid of books. The "sums" were set by the master orally and were worked out by the pupils on foolscap paper or in "cyphering books". The most popular text was *Pike's Arithmetic*. Park's and Emerson's arithmetics and the *Western Calculator* and *Federal Calculator* were used occasionally.

Rarely was there a teacher who could take his pupils beyond the "rule of three". "The one who got through this," says W. J. McKnight, "was called tolerably good in figures; and the lucky wight who got through the book was considered a graduate in mathematics." To go through the book and have all the sums copied neatly in a large blank book prepared for this purpose was considered a great achievement.

After 1800 the few country schools that undertook to teach the "higher branches"—geography, grammar, "mental arithmetic" and history—were considered as having embarked upon a dangerous venture and there was much hostility to the innovation at first. *Murray's Grammar, Kirkham's Grammar* and *Malte Braun's Geography* were the most popular texts. Not until some years after the adoption of the common school system in 1834 were these subjects regularly taught in rural schools.

Bible reading was featured in all schools. Morning and afternoon sessions were opened with Bible reading and prayer. Much of the required reading was from the Scriptures. Church schools also gave instruction in memorizing hymns, creeds, and catechisms. Sometimes singing was taught, as a religious exercise.

Teaching facilities other than text were very meager. There were no blackboards or wall maps. A few sheets of foolscap sewed together, a bottle of home-made ink and a crow-quill pen comprised the pupil's outfit. Ink was made by boiling together oak and maple bark and adding copperas. The purple juice of pokeberry also was used. Occasionally ink was made from "ink powder" bought at the country store but this faded quickly. The writing paper used up to 1840 was unruled; a thin piece of lead called a plummet, which was kept in the master's desk was used to rule it. A lead pencil was a luxury which few could afford

METHODS OF TEACHING

Until after 1840 most rural schools were ungraded. Instruction was largely individual; there were about as many classes as there were pupils. Usually the master sat on a raised platform at one end of the room where he could keep a sharp watch over his charges. He opened school by calling out, "Books!" Then the hub-bub began, for the pupils studied out loud. There was no recess; the day was broken only by the noon intermission.

The master made or mended pens from quills supplied by the pupils. He set the copy for writing lessons, perhaps one of the pithy sayings of Poor Richard:

> A man of Words and not of deeds,
> Is like a Garden full of Weeds.

Hanging by the door was a paddle on one side of which was printed the word "out," and on the other side the word "in". When a pupil secured permission to leave the room temporarily he or she turned the paddle to "out," and on returning to "in". Spelling contests in which the whole school participated, speaking "pieces" on the "last day of school" and other special exercises varied the routine. Another diversion was "barring out the master". This occurred at the Christmas season. If he was not able to force an entrance he was admitted by the pupils only if he promised to treat the whole school.

The most important qualification of a school-master, perhaps, was ability to maintain order. Some of his pupils were likely to be stalwart and mischievous older boys who would like nothing better than to upset the authority of the master. If a new master did not assert his authority at once and uphold it firmly his tenure was brief. Sometimes he had to engage in hand-to-hand fights with young ruffians whose consuming ambition was to "put out the master".

Severe punishment was meted out even for such minor offenses as whispering, playing tit-tat-too with a seat mate or throwing paper spit balls. The penalty for not knowing a lesson was a flogging. It was thought that the lesson could be permanently impressed upon the minds of the young by administering a sound whipping at the same time; that this served to strengthen memory by association of ideas. The ancient adage "Spare the rod and spoil the child" was considered to be nothing less than inspired prophecy.

A bunch of well-seasoned hickory rods, sometimes called "wattles," was standard equipment in all rural schools. Samuel W. Pennypacker characterized Patrick Doyle, a schoolmaster at Phoenixville about 1810, as "easily aroused by anything that seemed to threaten the dignity or authority of his calling. He was thoroughly imbued with the idea that the only way to reach the intellect of boys was through the seats of their breeches. His rods, designated by the soft and seductive title of 'mint sticks' were arranged in the schoolroom in rows and were graded in proportion to the size of the unfortunate youths who had awakened his wrath."[32]

This mode of instruction was derived from Great Britain. James P. Wickersham tells of an old-time English schoolmaster "who, in his fifty-three years of service, according to his own faithful record, administered the following punishments: 911,500 canings, 121,000 floggings, 209,000 custodies, 10,200 ear-boxes, 22,700 tasks, 136 tips with the rule, 700 boys caused to stand on peas, 6,000 to kneel on sharp-edged wood, 5,000 to wear the foolscap, 1,700 to hold the rod—in all, 1,282,036 cases of punishment. Discipline in early Pennsylvania schools was administered in the same spirit if not with the same zeal. An average of ten or even twenty whippings a day for a whole term neither excited surprise on the part of the pupils nor provoked inquiry in the neighborhood. There were multitudes of boys who received their whipping every day about as regularly as they recited. Such was the temper of our tough old grandfathers that, in addition, these luckless youths were apt to be whipped at home for being whipped at school."[33]

If the good right arm of the ill-tempered schoolmaster tired from much flogging it was relieved by the imposition of other modes of punishment, some of them incredibly brutal. Speaking of schools in northwestern Pennsylvania about 1805, W. J. McKnight says, "One of the favorite modes was what was termed 'cut jackets'. This was resorted to in case two were to be punished. Each offender selected his rod and, at a given signal, began a most furious attack upon the other. This would continue in the most brutal manner until often the blood would trickle down on the floor. . . . The boy with the most physical strength and endurance was the envy of the school and the boasted pride of his parents.

"Another barbarous mode of punishment was termed 'running the gauntlet'. The offender was carried on the back of an older boy around the circle of the other pupils, in which selected boys struck him with a rod as he passed. This punishment was often brutally severe."[34]

A hickory stick was the least vicious of pedagogical instruments for imparting knowledge. In northwestern Pennsylvania, "The masters invariably kept what was called toms or, more vulgarly, cat-o-nine-tails, all luck being in odd numbers. This instrument of torture was an oaken stick about twelve inches long to which was attached a piece of raw-hide cut into strips, twisted while wet and then dried. It was freely used for correction and those who were thus corrected did not soon forget it. Not a few carried the marks during life."[35]

Other approved means of promoting the intellectual growth of youth were to suspend them from the top of the schoolroom door by twine tied to their thumbs; to tie up one leg so that the culprit had to stand on the other until he dropped; to place a "dunce cap" on his head and stand him in a corner for the other pupils to scoff at. Irate schoolmasters boxed ears until they rang, pulled them until they stretched, twisted noses until they bled. The righteous wrath of the master was not visited upon girls as much as boys but girls took their full share of ear-pullings, hand-slappings and not infrequently the application of the hickory to that part of their anatomy on which they sat.

Severe corporal punishment continued to be the dominant pedagogical practice in rural schools until after 1840. Here and there voices were raised in protest against it, as by Christopher Dock between 1714 and 1771, and Benjamin Rush in 1790. The inauguration of the common school system in 1834 marked the beginning of the substitution of moral suasion for physical punishment.

In spite of obvious defects in rural schools prior to 1840—in teachers, curricula and methods of instruction—those pupils who were of a mind to study could acquire a fair elementary education, sufficient to gain them admission to an academy for further training. It was sink-or-swim instruction and tended to develop personal initiative and independence of thought. It had the great advantage of being individualistic; the plastic minds of all pupils were not poured into the same mold.

OTHER RURAL EDUCATIONAL AGENCIES

Previous to 1800 comparatively few Pennsylvania farmers read periodicals and fewer still read books, except the Bible and the hymn book. The first printing press in Pennsylvania was established at Shackamaxon, now Kensington, Philadelphia, in 1686 by William Bradford. One of the first publications to come from this press was "An Almanac for the Christian Account of 1687," by Daniel Leeds, "Student in Agriculture". Bradford became involved in a controversy with the dominant Quaker party, which placed his publications under strict censorship. In 1690, impatient at these restrictions, he moved his press to New York. Leeds went with him and we hear no more of this "Student in Agriculture". Soon thereafter the principle of a free press was established in the Quaker City; Philadelphia then became the chief publishing center of all the colonies.

From 1730 to 1830 the periodicals read most widely in Pennsylvania rural communities were almanacs, which were published annually. In addition to weather forecasts, astronomical observations and a calendar of timely farm and home operations, they contained many brief items of entertainment and general education on a great variety of subjects.

The two most famous almanacs in Pennsylvania were Christopher Sauer's *Der Hochdeutsche Amerikanische Kalender* and Benjamin Franklin's *Poor Richard's Almanack*. The Sauer publication first appeared in 1738 and was printed annually by him and by his son for thirty-nine years. Poor Richard's Almanac (1732-1757) featured the pithy sayings and counsel of a mythical Richard Saunders. There were many would-be imitations of this almanac but none could approach the standard of the inimitable Franklin. Other almanacs having wide circulation were the *Neuer Gemeinnützinger Kalender,* published by John Bear and his successors in Lancaster for more than a century; and the *Neuer Readinger Kalendar,* published by the *Readinger Adler.* For many years almanacs were the most important educational agency in rural homes.

Soon after 1800 newspapers began to replace the cherished almanacs in popular favor. The first newspaper of the province, the *American Weekly Mercury,* was published by Andrew Bradford of Philadelphia; the first issue appeared on December 22, 1719. It continued publication until 1747. On December 24, 1728, the eccentric Samuel Keimer began publication of *The Universal Instructor in All Arts and Sciences and Pennsylvania Gazette.* On September 25, 1729, Benjamin Franklin became the owner of this practically moribund publication and soon transformed it into the most influential journal in America under the name, *Pennsylvania Gazette.* It continued publication until 1845.

On August 20, 1739, Christopher Sauer of Germantown began publication of *Der Hoch-Deutsch Pennsylvanische Geschicht-Schreiber,* later called *Germantauner Zeitung.* After 1775 it was a weekly. For many years this was the only Pennsylvania newspaper printed in German. It had a wide circulation among German farmers and largely guided their thinking and action, especially on political matters. The first daily paper in America was *Pennsylvania Packet,* which was begun in Philadelphia in November 1771 by John Dunlop as a weekly; it was converted into a daily in 1784 by D. C. Claypoole. The *Mercury Gazette* and *Packet* had the largest rural circulation.

According to Benjamin Franklin, in 1753 there were six printing houses in the province, two of which published in English, two in German only and two in both languages. In 1762 five German newspapers were published in Philadelphia, one in Germantown and two in Lancaster. By 1775 there were nine newspapers in Pennsylvania, of which six were printed in English and three in German. All but one, the *Neue Unpartheyische Lancäster Zeitung,* were published in Philadelphia. This newspaper contained so many articles on agriculture and country life that it almost served the purpose of the present day agricultural press for farmers of Lancaster and adjacent counties.

After the Revolution the number of newspapers, mainly weeklies, increased rapidly and they were more widely read in rural districts. *Der Readinger Adler,* a weekly, was founded in 1796. Because of its wide circulation and great influence among the farmers of Berks County it was called "the Berks County Bible". In 1900 Levi Oscar Kuhns reported, "The *Reading Adler* has been in existence for 104 years and is still read by Berks County farmers with something of the same feeling with which the London merchant reads his *Times*."

The first newspaper in western Pennsylvania was the *Pittsburgh Gazette,* a weekly established in 1786 when Pittsburgh was a village of 500, by John Scull and Joseph Hale. For nine years it was the only newspaper published west of the Alleghenies. By 1790 it was widely distributed among the 60,000 inhabitants of southwestern Pennsylvania. In its early years the editors found it necessary to request frequently that those in arrears on their subscriptions make immediate payment "in wheat, rye, flour or whiskey".

Early newspapers were small sheets of four pages only. As viewed by present standards they were exceedingly dull reading. Foreign news was three or four months old, domestic news often a month old. There was little local news. Newspapers had not yet acquired modern sensationalism in reporting news but their columns were spiced with letters from "Constant Reader". These aired not only quarrels and disputatious political views but also personal sorrows and domestic unhappiness, without reticence. Political editorials were characterized by extreme bitterness, even to defamation of character. After 1800 the press played an important part in shaping the views of rural people.

Few Pennsylvania farm families read magazines except denominational publications. *The Portfolio,* first magazine devoted to literature in America, began publication in Philadelphia in 1801 and continued until 1827. Some of the most noted writers in the country contributed to it. *Godey's Lady's Book,* later called *Godey's Magazine,* began publication at Philadelphia in 1830 and continued until 1898. It had very wide circulation, including many rural families. It was primarily the arbiter of feminine fashions but numbered among its literary contributors such distinguished authors as Edgar Allen Poe, Washington Irving, Nathaniel Hawthorne, Oliver Wendell Holmes and Bayard Taylor. It was edited for forty years by Sarah Josepha Hale, the first woman editor in America. *Godey's Lady's Book* simpered with Victorian sentimentality and affectation, but it had superb illustrations and was a powerful advocate of better educational opportunities for women. Bound volumes of it are among the treasured heirlooms of many Pennsylvania farm families that have been on the land for three or more generations. Other magazines which had considerable rural circulation were Matthew Carey's *American Museum* (Philadelphia, 1787-1792) and his *Columbian Magazine* (Philadelphia, 1786-1792).

The politically dramatic period from 1740 to 1790 was the age of pamphleteering. Heated religious and economic discussions and blistering political diatribes were printed as pamphlets. The first publication from Benjamin Franklin's press was a tract; for a long time these were the main product of all presses. Many sermons, particularly those of

George Whitefield, were circulated as pamphlets. *Letters of a Pennsylvania Farmer,* a series of tracts by John Dickinson, had wide circulation and were a potent factor in furthering the patriot cause.

Prior to the Revolution few Pennsylvania farmers read any books but the Martin Luther or King James versions of the Bible, the catechism and the hymnal. A few had copies of Bunyan's *Pilgrim's Progress.* Most of the early books printed in Pennsylvania were of a religious nature. The first German book was Conrad Beissel's *Buchlein vom Sabbath,* published by Andrew Bradford in Philadelphia in 1728. In 1739 Christopher Sauer of Germantown printed *Weyrauche Hügel,* an 800 page collection of hymns. In 1743 Sauer printed the first edition of the German Bible, 1248 pages. Although the price was reasonable (18 shillings) Sauer announced, "To the poor and needy we have no price." One of the most noted of early colonial books was printed in 1749 at the Ephrata Cloister. It was a volume of 1300 pages, mainly hymns and religious poems, and required three years for printing.

Johann David Schoepf, who traveled extensively in Pennsylvania in 1783 and 1784, noted the book shelf of German farmers: "The economy of the German farmer in Pennsylvania is precisely the same as that customary in Germany. . . . A great, four cornered stove, a table in the corner with benches fastened to the wall, everything daubed with red; and above, a shelf with the universal German farmer's library—the Almanack, Songbook, a small *Garden of Paradise,* Habermann (prayer book) and the Bible. It is in vain to look for other books; whereas in the cabins of the English there are not seldom seen at least fragments of the *Spectator,* journals, magazines or dictionaries." [36]

After 1800, with greater prosperity and enhanced educational opportunities, more farm families began to read books. Those most likely to be found in the homes of English and Scotch-Irish farmers, aside from the Bible, hymnal and catechism, were the writings of Shakespeare, Milton, Scott and Dickens, all of which were first printed in America at Philadelphia. Washington Irving, J. Fenimore Cooper, Edgar Allen Poe and Nathaniel Hawthorne were the most popular American authors. Bunyan's *Pilgrim's Progress* was required reading for rural children on Sunday afternoon, while their elders perused such light reading as Baxter's *Saints' Everlasting Rest,* Fox's *The Life of Martyrs,* Watts' *Improvement of the Mind* and *The Practice of Piety.*

About 1800 annual "gift books" held sway. They were beautiful and expensive examples of the art of printing and binding but quite arid in content. Such, for example, were *Friendship's Offering, The Floral Wreath* and *The Dew-Drop.* These jewels of Victorian affectation, with their gruesome descriptions of the horrible death of sinners, and mawkish sentimentality, were considered to be appropriate gifts from young men to the ladies of their choice. Happily, they passed out about 1840.

Although last of the thirteen original American colonies to be settled, Pennsylvania was first to establish a subscription library. Benjamin Franklin was the moving spirit in founding the Library Company of Philadelphia in 1731. According to Thomas A. Glenn, however, the first circulating library in the province was established in the Welsh Tract before 1697. He says, "It is noted then, 'Friends think it meet that Friends' books belonging to the Weekly Meeting of Radnor, Haverford and Merion, be brought once a week.' In 1700 a purchase of twenty-five books is noted. Among these were Caleb Pusey's *Answer to Daniel Leeds,* Joseph Wyett's *Remarks on Dr. Brays,* William Sherman's *Epistles* and similar light and cheerful works."[37]

In 1749 Peter Kalm wrote concerning the Library Company of Philadelphia, "A number of gentlemen came together and each gave forty shillings for the purchase of books, so that one hundred pounds were acquired for the purpose. . . . There are now several branches here where books may be borrowed for a small fee. . . . Proprietor Thomas Penn presented the city with a piece of land for the building."[38] The library published its first catalog in 1741. In 1814 it contained 14,000 volumes and had 500 subscribers, each of whom paid an entrance fee of forty dollars and annual dues of two dollars.

The Loganian Library, comprising the books of James Logan, was established in 1745. It was housed in the first building devoted solely to the use of a library in the United States. It was merged with the Library Company of Philadelphia in 1791.

While early libraries were mainly urban, several were established in rural districts, as at Darby in 1743, Germantown in 1745, Hatboro in 1755 and Lancaster in 1759. All were subscription libraries, not free libraries supported with public funds. In most rural districts the only circulating libraries were those of Sunday Schools and practically all books were religious, not secular.

THE REIGN OF SUPERSTITION

In spite of the gradual development of better schools and other agencies for instruction, the progress of education was slow. It was not uncommon for whole families to grow up without being able to read or write. In 1832 it was authoritatively stated, "More than one half the children of the commonwealth between the ages of five and fifteen years have not had the benefit of school instruction; hence a large proportion of our adult population can neither read nor write. In some places the inhabitants of whole districts are growing up destitute of instruction, unacquainted with their duties as citizens."[39]

"The education of the children of the pioneers," thus reported A. S. Jones, "was first to feed and take care of the cattle, to handle the grain skillfully, make accurate strokes with the axe, cut grass and handle the sickle and flail with dexterity. To clear off the most land for next year's crop and make the most durable web of linen or linsey-woolsy were of more importance than to learn to read and write and calculate accounts." Under these conditions custom and tradition had a tenacious hold on farmers, especially those who had no schooling. They were ultra-conservative. In 1822 an exasperated observer of the rural scene exclaimed, "The farmer believes nothing he hears, but requires to see and feel before he gives credit to what he has been told, and then rarely acts immediately upon his belief."

The English and Scotch-Irish were hardly less superstitious than the Swedes and Germans. Some of their spiritual and intellectual leaders, the ministers, bitterly opposed the use of lightning rods and preached sermons against them, arguing that such an attempt by man to escape the justifiable wrath of God for his sins was impious defiance of the Deity. During the "Dark Day" of May 19, 1780, when there was a total eclipse of the sun, they yielded to superstitious terror. Whittier describes the scene in *Abraham Davenport:*

> There fell over the bloom and sweet life of Spring,
> Over the fresh earth and heaven of noon,
> A horror of great darkness, like the night
> The day of which the Norland sagas tell—
> The twilight of the Gods. . .
> Birds ceased to sing, and all the barnyard fowls
> Roosted; the cattle at the pasture bars
> Lowed, and looked homeward; bats on leathern wings
> Flitted abroad; the sound of labor died.
> Men prayed and women wept; all ears grew sharp
> To hear the doom-blast of the trumpet shatter
> The black sky.

The descendants of the ancient Teutonic denizens of the Black Forest and Hartz Mountains were superstitious to an almost incredible degree. Virtually all of their superstitions had been imported from the fatherland, where they had been handed down from one generation to another by word of mouth.

The heathen gods most frequently represented in German superstition were Tiu (Tuesday), Wodan (Wednesday) and Thor (Thursday). The horseshoe as a symbol of good luck was supposed to derive its potency from Wodan, to whom the horse was sacred. The broom, which figured prominently in witchcraft, was sacred to both Donar and Wodan because of its supposed relation to lightning. Opening the Bible at random and taking the verse which fell under the finger as direct and specific guidance from God—a practice that had come down from the Middle Ages—was employed in deciding many of the problems of life including, among Moravians, the selection of a partner in marriage.

"In old German almanacs," says Levi O. Kuhns, "certain days were marked as lucky or unlucky. Anyone born on an unlucky day was doomed to poverty and engagements or marriages contracted on that day were sure to be failures. The unlucky days were January 1, 2, 3, 4, 6, 11, 12; February 1, 17, 18; March 14, 16; April 10, 17, 18; May 7, 8; June 17; July 17, 21; August 20, 21; September 10, 18; October 6; November 6, 10; December 6, 10, 15."[40]

It was sign of an early death in the family to break a looking-glass. If a dog or cat ran under the candle racks before dipping was finished, the candles would burn over a corpse within a year. For many years there was deep-rooted prejudice among Germans, especially in Berks County, against wearing crossed suspenders or "galluses."

> For an X is a hex in funny old Berks,
> Of bad luck a token—the Devil's own works.
> When writ on a back by two cross gallus straps,
> The safer suspender is one that ne'er laps.[41]

The use of supposedly magic formulas in incantations for aiming at curing the ills of man and beast was common among Germans; it still has a few faithful though misguided adherents. It is quite akin to the magic practiced by Indian medicine men. In the Pennsylvania German dialect a pow-wow "doctor" was a *Braucher.* Stripped of its supposedly occult hocus-pocus, designed to impress the superstitious, pow-wowing is a form of faith-healing. It may effect cures in a few cases, especially of nervous disorders—if the patient has sufficient faith.

In 1820 there was widely distributed in rural Pennsylvania a German book *Holman's Brauch Bichly.* This was reprinted in 1846 under the title *Der Lang Verborgne Freund* (the Long-Hidden Friend). This book contained explicit directions for the occult cure of the ills of credulous men and their beasts. Thus goiter was to be cured by looking at a waxing moon, passing the hand over the affected part and saying, over and over again, "What I see must increase; what I feel must decrease." Some German farmers firmly believed that the fertility of the soil on their farms could be enhanced more by pow-wowing than by the addition of manures and fertilizers. If crops were withering from drought, crouching on the ground and clapping two stones together, while repeating an incantation, was supposed to bring rain.

The incantation for the cure of *schwinde* (tetter) illustrates the customary procedure. Like all other pow-wow incantations, to be effective it must be learned by a man from a woman or by a woman from a man; and it must be administered by the "healer" only to humans or beasts of the opposite sex. The formula for tetter was:

"Make the sign of the cross three times on the sufferer's right hand. Then repeat:

"Geh aus dem Marks in die Knochen,
Aus dem Knocken in das Fleish,
Aus dem Fleish in das Blut,
Aus dem Blut in die Haut,
Aus der Haut in die Hohe,
Aus der Hohe seiben Klofter tie
in die Erde."

"Go out of the marrow into the bones,
Out of the bones into the flesh,
Out of the flesh into the blood,
Out of the blood into the skin,
Out of the skin into the sky,
Out of the sky seven yards deep in
the ground."

The most extreme and primitive manifestation of superstition was witchcraft. This also was a heritage from Europe. The validity of witchcraft was recognized by a provincial law entitled "An Act for the Advancement of Justice," passed May 31, 1718, which set forth, "And be it further enacted by the authority aforesaid, That another statute made in the first year of the reign of King James the First (1683) entitled 'An Act Against Conjuration, Witchcraft and Dealing with Evil and Wicked Spirits,' shall be duly put in execution in this Province."[42]

Witchcraft had high legal recognition. Lord Coke, a distinguished English jurist, defined a witch as "a person who hath conference with the devil, to consult with him and/or do his bidding." To deny that there were witches abroad who could at will change themselves into any kind of bird or animal and bedevil persons or livestock was heresy in the eyes of the law. William Penn presided at a meeting of the Provincial Assembly on February 27, 1684, when an alleged witch was on trial.

Most of the accusations brought against those who were suspected of being in league with the evil one were for causing livestock to be sick, or for causing cows to cease giving milk; but some were for bewitching people. If any calamity befell the family it was ascribed to the spells of a witch, who usually was thought to be some old crone of the neighborhood who was anti-social and generally disliked. The first recourse in such cases was to send for a witch doctor who—for a consideration—initiated a series of counter charms designed to neutralize the evil influence of the witch. German farmers took precautions to ward off the dire influence of witches on their livestock by cutting a triangle in the lintel of their barns. Following an especially severe outbreak of the devilish machinations of witches in Chester County, in 1719, a commission of justices of the county court was empowered to inquire into "all witchcrafts, enchantments, sorceries and magic arts."

Witchcraft continued to be a factor in the lives of some Pennsylvania farmers until about 1800. Describing pioneer conditions in southwestern Pennsylvania about 1763, Joseph Doddridge says, "When cattle or dogs were supposed to be under the influence of witch craft, they were burnt in the forehead with a branding iron; or, when dead, burned wholly to ashes. . . . Witches were often said to milk the cows of their neighbors.

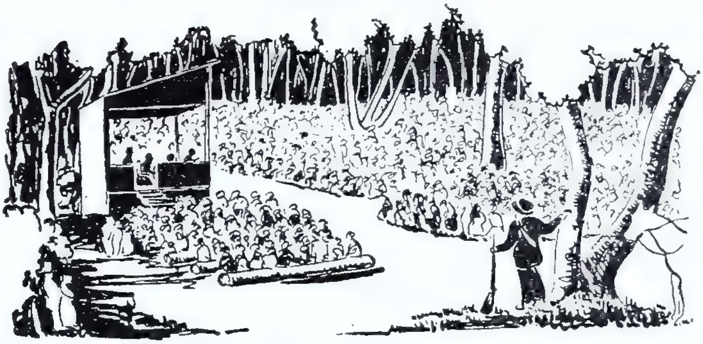
This they did by fixing a new pin in a new towel for each cow intended to be milked. This towel was hung over her own door, and by means of certain incantations the milk was extracted from the fringes of the towel after the manner of milking a cow."[43] Doddridge, who scoffed at this black magic, commented, "This happened when the cows were too poor to give much milk."

In 1786 Elizabeth Stout, a member of the Simpson's Creek Baptist Church in western Pennsylvania accused Givin Denham, the young wife of the minister, of being a witch because she "spewed up pins". According to W. J. McKnight, about 1800 "Some of the pioneers of this county [Cameron], in order to protect themselves from witchery, would burn hen's feathers and asafetida for incense; and shoot silver slugs at rudely-drawn portraits of those who were suspected of witchcraft."[44]

No Pennsylvania witches suffered the death penalty for their alleged alliance with the devil, as did those of Salem, Massachusetts in 1692, but some were imprisoned, fined, and lashed; and all were ostracised. This was only two centuries ago! We have come a long way since then in driving out superstition with knowledge, but some still remains.

Signs of the zodiac, as shown in old almanacs.

XXI



Pioneer church service in a grove.

THE RURAL CHURCH

THE MOST important contribution of Pennsylvania to the nation is not its great resources of coal and iron, nor the products of its fertile soil and teeming industrial life, but the concept and practice of religious liberty. The immigrants who came to the province on the invitation of William Penn were deeply and sincerely religious. Many of them had left their homeland because they were not permitted to worship God according to the dictates of their conscience. They braved the perils of the wilderness in order to establish here this paramount personal right.

Religious Liberty

In no other colony was freedom of worship guaranteed by law. At the time of the Declaration of Independence Pennsylvania and Delaware, the proprietary domain of William Penn, were the only colonies in which all Christians were equal before the law. In other colonies "heretics" and "dissenters" were subjected to severe punishment and persecution or were banished. Largely through the influence of the representatives of Pennsylvania, there was written into the Constitution of the United States this guarantee: "Congress shall make no law respecting an establishment of religion or prohibiting the free exercise thereof."

Due to Swedish settlers, forty-two years before the coming of Penn the foundation of the colony was laid in religious liberty. In 1640, when the good ship *Fredenberg* left Holland under the sanction of the Swedish Crown to establish the colony of New Sweden on the Delaware, the little company was charged, "Those who profess the one or the other religion live in peace, abstaining from every useless dispute." This enlightened policy was continued by the English during the administration of the Duke of York. His laws provided, "No Congregation shall be disturbed in their private meetings in the time of prayer, preaching or other divine Service. Nor shall any person be molested, fined or imprisoned for differing in Judgment in matters of Religion, who professes Christianity."[1]

In 1682 William Penn came into possession of the grant made to him by Charles II. Penn was a Quaker whose liberty to worship God according to the highest light he knew had been restrained by both civil and ecclesiastical power. Penn incorporated into his "Great Law" of December 10, 1682, this charter of religious liberty:

"No person, now, or at any time hereafter, Living in this Province, who shall confess and acknowledge one Almighty God to be the Creator, Upholder and Ruler of the World, and who professes him or herself Obliged in Conscience to live peaceably and quietly under the Civil Government, shall in any case be molested or prejudiced for his or her Conscientious persuasion or practice in matters of faith and worship, but shall freely and fully enjoy his or her Christian liberty."[2]

At another time Penn ordered, the General Assembly concurring: "That no one sect may raise itself above the others; each shall enjoy freedom of conscience, and no one shall be forced to be present at any public services for the worship of God, and no one shall be disturbed in his belief or religion."[3] In his "Charter of Privileges," granted October 28, 1701, constituting the permanent form of government, Penn reaffirmed this covenant, declaring, "No people can be truly happy, though under the greatest enjoyment of civil liberties, if abridged of the freedom of their consciences as to their religious professions and worship."

Religious freedom under Penn, however, was relative, not absolute. public services for the worship of God, and no one shall be disturbed in their right to worship as they chose; but it was provided that officeholders and voters should be only "such as profess and declare they believe in Jesus Christ to be the Son of God and Saviour of the World." This excluded Jews, Unitarians and atheists from the privilege of citizenship.

William Penn's enlightened charter of religious liberty, much like his program of free public education, was far in advance of his time. The people adhered to it in letter, because it was the law of the land, but not always in spirit. There were many religious sects; not always was there mutual tolerance. Some anti-Catholic sentiment developed in the province. In 1708 Penn was under fire in England for permitting mass to be celebrated in his province. The anti-Catholic feeling resulted mainly from wars between Protestant England and Catholic France and

Spain; also from the activity of Jesuits in extending French influence among the Indians.

The clash of conflicting nationalities and religions in Pennsylvania was not without benefit. It was responsible, in large measure, for the independence of thought and action that has characterized the Keystone state from its birth.

EARLY CHURCHES

The strongest religious influence in the colony prior to 1700 was the Swedish Lutheran Church. The little band of Swedes under Peter Minuit, which entered Minquas Creek in April 1638, included a minister of that faith, Rev. Reorus Torkillius. He was the first ordained minister in the province. The first church was built in 1643 by Governor Johan Printz, on Tinicum Island. It was destroyed by fire in 1645, rebuilt in 1646, and dedicated by Rev. John Campanius on September 4, 1646.

On July 2, 1700, the Swedes dedicated a church at Wicaco, at a spot now near the corner of Christian and Front Streets, Philadelphia. This building, which is known as "Gloria Dei," or "Old Swedes' Church," still stands. It was sixty by thirty feet, brick and stone, and was one of the most beautiful houses of worship in the province. It cost 20,000 Swedish dollars.

The Swedes built other churches along the Delaware. From 1696 to 1786 the government of Sweden sent twenty-four clergymen to minister to these churches, bearing the expense from its "Mission to the Swedes in America". Swedes were active in seeking to Christianize the Indians. In 1642 the elder Campanius began to make a vocabulary of the language of the Delawares; and in 1696 he completed a translation of Martin Luther's *Shorter Catechism* into that tongue. This was the first attempt to reduce the language of any tribe of Indians to writing. After 1685 English and Welsh Quakers came to the colony in such large numbers that Swedish Lutherans became a minority group.

The Duke of York's Laws were promulgated on the Delaware on September 22, 1679. They provided, "That in each Parish within this Government a Church be built in the most convenient part thereof, Capable to receive and accommodate two Hundred Persons."[4] This ambitious program was not executed.

Immediately upon their arrival in the land of promise, Friends began to build Meeting Houses. The first, a small log structure, was erected in Philadelphia in 1682. A brick house of worship was built in 1684. The Friends Meeting House in Lower Merion Township is the oldest of that faith in America. The oldest part was built in 1695; it was completed in 1713. This building is on the site of a log Meeting House built in 1683. The Merion Meeting House is more intimately associated with the settlement of Pennsylvania and the days of William Penn than any other public building still preserved. By 1700 there were three Meeting Houses in Philadelphia and others at Germantown, Neshaminy, Darby, Abington and elsewhere.

Swedish Lutherans and Friends were the only religious groups that held services until 1684, when Baptists built a church at Cold Spring, Bucks County. Roman Catholics had a small chapel in Philadelphia in 1686. In 1687 Welsh Baptists established a church at Pennypack; Presbyterians formed a congregation in Philadelphia in 1692 and Episcopalians about 1695. The beautiful little Episcopal church, "St. David's," built by the Welsh two centuries and a half ago, still stands at Radnor. The first Lutheran church was a log structure built at New Hanover in 1703. Mennonites who settled at Germantown in 1683 built a log church there in 1708 and another at Skippack in 1725. The famous school at Skippack taught by Christopher Dock was connected with this church.

ENGLISH-SPEAKING RELIGIOUS GROUPS

"There is a saying," observed Gottlieb Mittelberger in 1754, "that Pennsylvania is the farmers' heaven, the mechanics' paradise and the ministers' pandemonium." This comment was in reference to the multiplicity of religious sects in the province and the uncompromising zeal of each.

Friends constituted the predominant religious group from 1683 until about 1730. Between 1682 and 1700 the majority of immigrants were English and Welsh Quakers. When William Penn died in 1718, about half of the 40,000 people in the province were Friends. The "Keith Disturbance" in 1692, created a schism among them which time did not heal. By 1750 there were more than fifty Friends' Meeting Houses, mainly in the three original counties but four were west of the Susquehanna.

The numbers and influence of Friends as a religious group waned during and after the Revolution because of their non-combatant belief and because of their uncompromising maintenance of a rigid standard of conduct. A majority of the merchants of the province were Quakers, but many farmers also adhered to that faith.

The basis of Quakerism as taught by its founder, George Fox, was the thesis that each soul is answerable only to God in matters of religious faith, not to government or any ecclesiastical organization; that the Holy Spirit is within every human being and that this "inner light" is sufficient illumination for the pathway of life. From these central beliefs came two correlaries which helped to mould colonial Pennsylvania—religious tolerance, and the equality of all men before the law, which is democracy.

During the eighteenth century, practically all Scotch-Irish immigrants were Presbyterians. They carried their stern Calvinistic religion with them into the wilderness and were chiefly responsible for establishing a Christian civilization in western Pennsylvania. By the time of the Revolution, Presbyterians were the most numerous religious group in the province. Their greatest strength was in the Cumberland Valley and west of the Susquehanna.

Since the Episcopal church was the state church of England, the British ministry sought to establish it as the state church of Pennsylvania also. This proposal met with a very cool reception, mainly because most of the settlers were decidedly averse to state control of religion after their experiences in Europe; but also for reasons set forth by William Cobbett, an Englishman who tarried in Pennsylvania in 1818. He wrote, "I have talked to several farmers here about the tithes in England. They seem not to believe that the English farmer is compelled to give the Parson a tenth part of his whole crop, and of his fruit, and milk and eggs and calves and lambs and pigs and wool and honey. They cannot believe this." Most of the membership of the Episcopal Church was in the urban areas of southeastern Pennsylvania.

Baptist strength centered in the counties adjacent to Philadelphia but there were a few churches in the western part of the state. Like the Episcopal church, membership was drawn mainly from the English and Welsh. The first service of the Methodist Episcopal church in Pennsylvania was held in Philadelphia in 1768. After the Revolution Methodists became an important factor in the religious life of the Commonwealth. Bethel, the first rural church of this denomination, was built in Montgomery County in 1770.

The Methodist Episcopal Church in America was born at a conference in Baltimore in 1784; previously the followers of John Wesley had been a branch of the Church of England. They immediately organized a system of circuits, with a minister assigned to each. The emotional appeal of John Wesley, who came to Philadelphia in 1771, and his colleague, George Whitefield, stirred their followers to intense missionary zeal. "Circuit riders" penetrated remote parts of the western frontier and vied with Presbyterians in establishing a Christian civilization west of the Susquehanna. Speaking of conditions in that region W. J. McKnight said, "The pioneer ministers and missionaries traversed the hills and valleys, gathering the scattered settlers in little assemblages to worship. In our day it is impossible to appreciate the difficulties and hardships they encountered on such missionary tours. There were no bridges; when creeks were swollen they had to swim their horses across."

There were few Roman Catholic churches or Jewish synagogues in Pennsylvania previous to 1840; the great advance of these religious groups came with the industrial revolution.

GERMAN-SPEAKING RELIGIOUS GROUPS

Most of the Germans of colonial Pennsylvania were farmers. Germans were preponderant in the central and large parts of rural southeastern counties. The most distinctively German counties were Berks, Bucks, Carbon, Dauphin, Lebanon, Lehigh, Lancaster, Monroe, Montgomery, Northampton, Northumberland, Schuylkill, Snyder and York.

A majority of early German immigrants to Pennsylvania were adherents of the two leading confessions in Germany at that time, Lutheran and German Reformed. Some members of the Reformed Church came from Switzerland and the Palatinate; Lutherans came mostly from Württemberg and other parts of Germany. Until about 1740, adherents of the German Reformed Church outnumbered Lutherans; but by 1786 Lutherans exceeded all other religious groups in the province except Presbyterians.

Heinrich Melchior Muhlenberg, who came to America in 1742, has been called "The Father of the Lutheran Church in America." He was one of the foremost religious leaders of his time and a great organizer; many churches in Pennsylvania were founded as a result of his inspired evangelism. Since most members of the Lutheran and Reformed churches lived in sparsely settled rural districts, they commonly erected union church buildings, in which each group worshipped on alternate Sabbaths. Unlike German sectarians and Friends, they were not opposed to military service; they participated freely in the Revolution and some of their pastors were army chaplains.

The several religious groups of early Pennsylvania that comprised the German sectarians were adherents of the "Quietist" movement in Europe. This was a reaction against formalism in religion and emphasized the paramount importance of the inner life of the believer. All of the sects abjured "worldliness" and were conscientious objectors to bearing arms in war or to taking oaths. They desired to live at peace with all men and were opposed to military preparation, even for defense. Sectarians made no attempt to defend themselves against Indian attack. They believed, and practiced literally, the biblical injunction, "Love your enemies."

Sectarians resisted the encroachment of government on their lives. Most of them were closely akin to Quakers in religious conviction and supported the ruling Quaker party politically. They practiced close communion and forbade marriage outside the group. There was some antagonism between the several sects but this had largely disappeared by 1800.

The principle sects in this large group of German believers were Mennonites, German Baptist Brethren or Dunkers, and Moravians. Smaller groups included Schwenkfelders, who settled on the Skippack in Montgomery County in 1734, *Siebentaegers,* or Seventh Day Baptists, Pietists, Separatists and Evangelicals.

The first German immigrants who established a community at Germantown in 1683 under the leadership of Francis Daniel Pastorius were Mennonites. They were named after Menno Simon, who led a religious movement in Holland about 1536. Germantown Mennonites held beliefs so similar to those of their more numerous Quaker neighbors that the two groups often held joint meetings; sometimes Mennonites were called "German Quakers." Most Mennonites settled in Lancaster County, to which they immigrated in large numbers between 1710 and 1730. Like Dunkers, they were "Anabaptists," because they rejected infant baptism and practiced only adult baptism.

Mennonites were divided into a number of sects of which the most conservative were the Amish. These were followers of Jacob Amman, who separated from the Old Order Mennonites about 1693. After 1870 the Amish, in turn, became divided into two factions, Church Amish (of two schismatic groups) and House Amish. The former worshipped in churches, the latter in homes. Previous to 1870 all Amish worshipped in homes, not in churches. Amish settled in Berks County in 1714 and also in Lancaster, Chester, Somerset and a few other counties.

Mennonite beliefs were limited to the life and teachings of Jesus, as recorded in the New Testament, their rule and guide of faith and practice. Like other sectarians they were strongly opposed to the union of church and state and to attempts of government or any ecclesiastical organization to compel anyone to conform to a certain religious doctrine. They were thrifty farmers and lived on the land in closely knit religious-economic communities. They desired to be

"little and unknown,
Loved and prized by God alone."

The customs and dress of Mennonites, particularly Amish, differentiated them from other people. They considered themselves a "peculiar people," because the Bible says that God's people are "not conformed to this world."[5] Non-conformance was one of their cardinal religious convictions. To this end they wore a peculiar and severe garb and gloried in being known as "plain people." The men wore broad-brimmed hats and shaved the upper lip only, leaving the beard long because Moses commanded the children of Israel, "Thou shalt not mar the corners of thy beard." Mennonite women wore plain black bonnets of distinctive shape. "Hooker Amish" used no buttons on their clothes, only hooks and eyes.

Another principle of the Mennonite faith was the Biblical injunction that God's people should separate themselves from the world: "Be not unequally yoked together with unbelievers, for what fellowship hath righteousness and unrighteousness."[6] This admonition prevented most Mennonites, particularly the ultra-conservative Amish, from joining any organization but their own church, even organizations designed to promote agriculture. The degree to which Mennonite farmers obeyed their church was not exceeded by any other religious group. Their loyalty was wholly to church and family and against the encroachment of government on their lives.

COMMUNISTIC RELIGIOUS GROUPS

From its beginning, Pennsylvania has been a land of free enterprise. A few communistic ventures have been made, but none was permanently successful. All of them were prompted by religious, not political, motives. The economic basis of all was agriculture.

One of the earliest manifestations of monastic spirit in America was the order of Pietists established in 1694 by John Kelpius, a German ascetic from Transylvania, and forty of his followers, on a ridge above the Schuylkill River, near the Wissahickon. The group was also called "Rosicrusians," or "Society of the Woman in the Wilderness". The monks lived in lonely retreats, some as hermits, and spent their days in contemplation and silence. Kelpius developed the first botanical garden in America. After his death in 1708 the group dispersed.

The most famous monastic-communistic group in early colonial Pennsylvania was established by the *Siebentaegers,* or German Seventh Day Baptists, sometimes called Dunkers. In 1735 they settled at Ephrata, Lancaster County, on Cocalico Creek. Under the leadership of Conrad Beissel they had withdrawn from the German Baptist Brethren in 1728. They were Protestant friars, pledged to celibacy, who lived simple and severe lives and were quite similar to the monastic order formed by Francis of Assizi. There was no written covenant; the New Testament was their confession of faith, code of laws and church discipline.

At first the Ephrata *Kloster* included only men. Soon pious women petitioned Beissel to be set apart similarly, so he formed the "Order of Spiritual Virgins," or "Roses of Sharon". The sisters lived in "Sharon" and "Kedar"; the brethren in "Zion" and "Bethel." All devoted themselves to "heavenly intercourse" when not engaged in necessary duties. Both monks and sisters wore long white robes and cowls and all initiates assumed new names. At the height of its influence, about 1770, the adherents numbered over 300 in residence at Ephrata, with many more outside the confines of the cloister. Men left their wives and women left their husbands to devote themselves to prayer and contemplation.

Members of the society lived frugally, mainly on the products of their own industry and donations from members when they withdrew from the "world". The Cloister operated a large farm and several shops and mills, including a grist mill, paper mill, oil mill, woolen mill and printery. It was a self-sufficing economic society as well as a religious cult. In constructing the buildings no nails were used and no metal for any purpose; wooden pins sufficed. The cells of both monks and sisters were about six by nine feet, with a single window, eighteen by twenty-four inches. "The doors of the Ephrata Protestant Convent," wrote Peter Kalm in 1749, "are so narrow that only one person can pass through at a time and if he is fat he cannot get through at all." They also were very low, so that the monks and sisters had to stoop when entering or leaving their cells—to teach them the virtue of humility. The "beds" were narrow planks and the "pillows" blocks of wood. In many other self-castigating ways these sincere men and women groped toward the truth as they saw it.

Although the religious aspects of the Cloister did not attain any considerable degree of permanence, the sect made notable contributions in other respects. It was one of the most important seats of learning and fine arts in the province. Its excellent school attracted pupils from Philadelphia and Baltimore. It had one of the first printing presses of the colony; during a period of twenty years this press printed about forty books, more than any other press in the province. Music was cultivated; Conrad Beissel was an accomplished musician, especially on the Aeolian harp, and a voluminous composer of religious music. The Cloister had a male and female chorus which sang in a distinctive manner, with a high hum.

Upon the death of Beissel in 1768, the society began to disintegrate, being divided by internal friction. His successor, Miller, lacked the qualities of leadership that had characterized Beissel. By 1814 most of the few surviving members renounced celibacy and merged with the Seventh Day Baptists. The branches that had been established at York, Bedford and at Snow Hill (Franklin County) soon faded or dissolved. By 1830 the society was practically extinct save for a few aged sisters. Some of the buildings still stand; they are preserved by the state as a memorial to these devout people, who played their brief part on the stage of life and then passed behind the great curtain.

The prosperous and distinctive settlements of Moravians at Bethlehem and Nazareth, Northampton County, in 1741 by Count Zinzendorf and his followers, and the subsequent settlement at Lititz, Lancaster County, were organized as a cooperative religious economy for about twenty years. The church controlled both the spiritual life and the industrial pursuits of its members. Only church members could own real estate and it was operated in common, in imitation of the custom of primitive Christians. This, however, was but a temporary expedient; as soon as danger of Indian attack was over, in 1760, the communal system was abandoned by mutual consent and the land divided among the members. The Moravians had a remarkable influence in the promotion of education and music and were active in missionary work among the Indians.

The spiritually energetic George Rapp, a German mystic from Württemberg and about 600 of his followers comprising 160 families, came to the province in 1803, fleeing from persecution in Germany. The group bought 5,000 acres of land in the fertile valley of the Conoquenessing, Butler County, and laid out the village of Harmony, where they awaited the second coming of the Lord. Most of the members practiced celibacy as a means of acquiring greater sanctity, but there were some married brothers and sisters. They held all property in common, wore a distinctive garb, were industrious and shrewd in farming and business, and laid much stress on music. The society very successfully operated farms, mills, furnaces, foundries, arts and crafts, and all other activities necessary in a more than self-sufficing community.

In 1815, lured by rumors of fertile land in the valley of the Wabash that was especially suitable for the culture of the grape, the society sold its Butler County holdings for $100,000 and bought 25,000 acres in Posey County, Indiana and founded there the village of New Harmony. This location proved unsuitable. So in 1825 the group moved back to Pennsylvania and bought about 3,000 acres in Beaver County, seventeen miles northeast of Pittsburgh, where was founded the village of Economy. Here they prospered greatly and eventually acquired ownership of many farms, cotton and woolen mills, tanneries, coal mines, breweries, distilleries and other business enterprises throughout southwestern Pennsylvania. The discovery of oil on their Warren County land added to the Society's already prosperous treasury. At the height of its prosperity, in 1830, the society numbered about 800 members. Its money built one of the best paying railroads in the state, the Pittsburgh and Lake Erie.

Like many of those outside the village, "in the world," the Harmonists could not stand great prosperity. Factions divided it. Lawsuits followed. In 1831 occurred "the great secession," led by a bogus Count de Leon. The unnatural state of celibacy depleted the ranks. Most of the members heeded the counsel of their leader and of the apostle Paul, "He that is unmarried careth for the things that belong to the Lord, how he may please the Lord; but he that is married careth for the things of the world, how he may please his wife." Upon Father Rapp's death, in 1847, his authority devolved upon nine elders. Many members, weary of the restraints imposed upon them by the ecclesiastical oligarchy, withdrew. By 1900 the Society had practically ceased to exist. In 1903 the property was purchased by a Pittsburgh syndicate for $4,000,000. The village of Economy now is part of the borough of Ambridge.

The Harmonists possessed sterling virtues—industry, economy, business integrity and deep religious faith; but they passed as a tale that is told. No longer does the night watch in the village of Economy intone,

"A day is past, and a step made nearer our end.
Our time runs away, and the joys of Heaven are our reward."

Ebb and Flow of Religious Faith

Religious, not economic motives dominated most of the original settlers of Pennsylvania. They were people of strong religious convictions. These continued to mould them and their descendents in varying degree, as influenced by changing economic and social conditions.

About 1720 there was a sharp decline in religious faith. Much of the sincere piety of early colonial days had been lost. Many were without church affiliation, which was almost unheard of in the time of William Penn. Some were openly and flagrantly atheistic. Public morale was low. Some years later Heinrich Melchior Muhlenberg declared, "Pennsylvania teems with a wicked, frivolous rabble. . . . The devil is raging and carrying on his slanders and calamities."

Beginning about 1740 an irresistible tidal wave of personal repentance and religious zeal swept over the colony, washing away much of the skepticism that had crept in. This movement has been called "The Great Awakening." The most outstanding figure in it was George Whitefield, a young deacon of the Church of England and a member of John Wesley's student club, derisively called "Methodists". For ten years, from 1739 to 1749, he toured the colonies, calling the people back to the faith of their fathers by his sincerity and persuasive eloquence. Although a Methodist, Whitefield knew no sect but Christian.

People flocked to hear him from great distances. His ministry in Pennsylvania was mostly in the southeastern counties but he spent some time in the vicinity of Harris' Ferry. No building could hold his audiences; often he preached in the open air to ten or fifteen thousand people. Farmers neglected their crops to attend Whitefield revivals.

The effect of Whitefield's ministry was magical. The religious faith of many thousands was strengthened. Weak churches became strong again. Even conservative "Old Side" Presbyterians caught fire from this great preacher. His efforts were ably seconded by Gilbert Tennent, a talented Presbyterian minister and teacher; Count Zinzendorf, a consecrated Moravian; Heinrich Melchior Muhlenberg, an inspired Lutheran evangelist, and many others. The tide of cynicism was turned.

This general religious fervor waned during the Revolution. All denominations suffered a sharp recession, Friends and Episcopalians most of all. Friends were placed in a very trying position. Many of them were loyal to Britain and nearly all were conscientious objectors to participation in war. A few Friends, called "Free Quakers" or "Fighting Quakers," supported the patriot cause by arms, and were promptly excluded from the fellowship. Thomas Mifflin, the first Governor of the Commonwealth was one; John Dickinson, a President of Pennsylvania's Supreme Executive Council, was another. Cynthia S. Holcomb reports that in Bucks County, "During the Revolution at Monthly Meetings (and for some time after) cases were brought to the Meetings of Friends who had in some way encouraged the conflict—by enlisting, by training, by paying a fine to avoid service, by serving as a member of a committee to advance the war. At the Wrighstown, Bucks County, Monthly Meeting, fifty such cases were considered and thirty-three of them disowned."[7] Similar action was taken at other Meetings. Families as well as churches were divided on this issue.

The Society of Friends was split asunder by the conflict between religious conviction and apparent patriotic duty; it never regained its former strength. Those who remained steadfast non-combatants were made to suffer for it. Many were fined, despoiled of their possessions and imprisoned. Some were exiled, mainly to Virginia; later these were repatriated. It is surprising that German sectarians, who were as strenuously opposed to the war as Quakers, as a matter of religious conviction, were not molested by patriots to any extent.

Episcopalians also suffered heavily. At their ordination, their clergy swore loyalty to the King of England, and their compensation was largely from the Church of England. Many lay members as well as clergy were loyalists. During the war Episcopal churches were closed or wrecked by patriots, and loyalists members were fined, imprisoned and exiled. Some Episcopalians, however, supported the patriot cause.

Presbyterians suffered a sharp decline during the war, but for a quite different reason. This was the most militant church of the Revolution; a very large number of its members served in the army and many Presbyterian ministers were army chaplains. With so many of their number in the army, rural churches declined and were revived after the war with difficulty. The British took special delight in burning Presbyterian churches, which they considered hotbeds of the rebellion.

As the Revolution came to an end, the new republic gradually entered in a prolonged period of religious recession. It became the fashion to pattern American customs and thought on those of France, our ally in the great struggle for independence. Skepticism and atheism, which then prevailed in France, gained many adherents in America and even threatened to engulf the religious institutions of the young republic. Scoffers were more numerous and more vocal than at any other time in our history.

This attitude was accentuated by the new-found political independence. Many people were inclined to cast off, or at least to question, the old faith, which was based on revelation, and to substitute therefor a faith based solely on rationalism. Tom Paine's *Age of Reason* was widely read and accepted, even in some hitherto conservative rural communities. A contributing factor to skepticism was the difficult times; after the Revolution paper money was practically worthless, speculation was rampant, and there was great confusion of political counsel. Moral and ethical standards were at a lower point than at any other period. People were disillusioned, bitter, reckless. This was fertile ground for the spurious seed of religious skepticism.

Reaction from this post-revolutionary religious and moral slump began in the early years of the nineteenth century and reached full power about 1830. Presbyterians of western Pennsylvania were first to feel the impulse in this state. The "Great Revival" began in Kentucky in 1797, swept through Tennessee, North Carolina and West Virginia during the next four years and reached western Pennsylvania in 1802. It was the most far-reaching religious awakening this country has ever known and brought about a lasting change.

Rural people flocked to revivals by thousands. John W. Dinsmore describes one such occasion in western Pennsylvania: "In the woods around the old log meeting house at Upper Buffalo was what probably was the most remarkable camp meeting ever known in America. It was in October, 1802, when the surrounding country was, as yet, sparsely settled and still mostly a vast forest. Yet there gathered together in the wilderness a concourse of above ten thousand people, coming from distances within a radius of a hundred miles; on foot, on horseback, in clumsy vehicles, bringing provisions with them and tarrying for many days."[8]

Revivals, or "protracted meetings," often continued for ten to twenty days, gathering momentum daily. Services were held in the evening, but sometimes in the daytime also. "The preaching," says John Hamilton of Centre County, "was of the most uncompromising character. Heaven as a reward and Hell as a punishment were preached with all the vigor that intense conviction of their reality could supply." Up front, close to the "amen corner," was the "mourners' bench," to which those who responded emotionally to the fervid exhortations of the preacher and the earnest solicitations of friends, repaired for penitence and guidance.

At that time nearly everybody believed implicitly that there was a personal devil with cloven hoofs and a forked tail who roamed the earth seeking whom he might devour or seduce from righteousness. The credulity revealed in the following incident, which was said to have occurred on July 1, 1717, was not at all uncommon a century later: "Last spring there occurred in this country a frightful event. A captain of a ship well known here in Pennsylvania, in the mouth of the Delaware on his way home from the West Indies Islands, was suddenly carried off by the devil and thrown out of the ship into the bay, in the sight of all the people of the ship, upon whom he vainly called for help. He had been a dreadfully wicked man in his time and especially he had deceived a young woman under promise of marriage, but had broken his promise and, no doubt, had a secret compact with the devil. . . . The circumstances have been examined in two places, namely, Philadelphia and New Castle, and found upon testimony to be exactly as stated."[9]

Demonstrations of religious enthusiasm at revivals often were fervid. Some converts were thrown, temporarily, into a trance. "In the pioneer days of this county [Erie]," says John E. Reed, "a peculiar form of bodily prostration occurred in connection with religious meetings. . . . I have seen men and women sitting in solemn attitude, pondering the solemn truths that were presented, and in a moment fall from their seats or off their feet if they happened to be standing, as helpless as though they had been shot; and lie for ten or fifteen or twenty minutes or even half an hour, as motionless as a person sound asleep; and then arise in the possession of all their bodily powers and take their seats without the least sensation of pain or uneasiness."[10]

By 1830 the religious awakening which had begun in western Pennsylvania had gripped the entire state. It became the absorbing interest of a majority of the people. Camp meetings held in groves during the summer months and revivals held in church buildings during the winter were centers of neighborhood interest. The religious faith of thousands was strengthened. Churches were quickened to new life and service. Missions were founded. As in the time of George Whitefield a century earlier, it was a "great awakening."

THE CLERGY

In colonial days the minister was looked up to in rural communities as a leader, not only because he was the shepherd of his flock but also because he usually was the best educated man in the countryside. His leadership was one of learning as well as character.

Although rivalries among different religious groups sometimes were intense, especially when different nationalities were involved, some ministers served all communions and were welcome in all. Such a one was Johan Dylandor, pastor of the Swedish Lutheran Church at Wicaco (Philadelphia). Peter Kalm says of him, "Once a month he went up to Lancaster to hold service. . . . The Germans came to church in a body on Sunday morning, with their psalmbooks under their arms. . . . In one week he gave sixteen sermons. He was incredibly beloved by all, high and low, rich and poor, by Englishmen, Swedes, Germans and by members of almost all denominations."[11]

Most of the clergy were an honor to their calling; a few were otherwise. In a sermon preached at Nottingham about 1745 Gilbert Tennent, whose father founded the celebrated Presbyterian "Log College" in Bucks County, denounced the ministers of his generation as "low-learned Pharisees, plastered hypocrites, having the form of godliness but destitute of its power." This intemperate generalization was not justified.

In early colonial days a few ministers became indentured servants in order to pay for their passage from Europe. "About the middle of the eighteenth century," says Cheesman A. Herrick, "a Lutheran congregation at York purchased and held under indenture a man who ministered to them as their pastor; and served written notice that it would prevent another congregation from taking away their minister without their consent."[12]

Various religious groups differed on the amount of education that they expected their ministers to have. Presbyterians insisted on a well educated ministry; Lutherans, Reformed and Episcopalians somewhat less so; Baptists, Methodists and German sectarians least of all. Even on the western frontier, where the groups of communicants were small and facilities meager, Presbyterians demanded well-trained ministers. These were supplied by their academies and colleges, as the "Log College" in Bucks County, the College of New Jersey (Princeton), and the academies at Cannonsburg, Washington, and Meadville. Every candidate for the ministry was required to pass a searching examination before the presbytery in literature, Latin, Greek, mathematics, philosophy, and Calvinistic theology; and to preach a "sound" trial sermon on an assigned Latin text.

Candidates for the Baptist and Methodist ministry, on the other hand, were judged more on their demonstrated ability to preach a "rousing" sermon and pray effectively than on their formal education; spirit counted more than erudition. Many ministers of these faiths, especially those on the western frontier, were comparatively uneducated men but they were fired with evangelistic zeal. This led them to penetrate secluded valleys and bring the gospel to farm homes far from beaten paths.

Clergymen of all denominations were leaders in promoting education. They taught schools and founded academies and colleges. Practically all institutions for higher education were established by religious groups and their heads and most of their teachers were ministers. It is doubtful if colleges would have been founded in colonial days had there not been a desire to provide an educated ministry.

Then, as now, ministers of the Gospel were certainly not overpaid. Not always was there assurance of continuity of support from the congregation. Many ministers had to find supplemental employment in order to eke out a living, as by farming, teaching and the crafts. Johan Campanius, minister of the early Swedish Lutheran churches on the Delaware, had a farm at Upland (Chester) and raised cattle. Connecticut settlers in the Wyoming Valley reserved 300 acres in every township for the minister.

On the frontier, the service of ministers was mostly a labor of love. Even the scant stipend often was several years in arrears. Money was scarce; it was customary to pay the preacher partly in farm produce. On April 11, 1798, the Presbyterian congregation at Congruity, Westmoreland County, agreed to pay Rev. Samuel Porter "one hundred and twenty Pounds, clear of all deficiency, the one half in merchantable wheat at five shillings per bushel, and the other half in cash.[13] This was a munificent salary for the times; prior to 1800 ministers' compensations were about $200 a year, often much less. At one time itinerant Methodist circuit riders received $64 a year and had to pay their own expenses!

John W. Dinsmore relates that a certain struggling church in southwestern Pennsylvania, being unable to raise cash to pay the minister, called for contributions of wheat and ground it into flour. Three members were delegated to take the flour down the Ohio and Mississippi to New Orleans on a flatboat and sell it. They had to walk back through the wilderness, two thousand miles; the entire journey required nine months. They brought back enough money to pay the minister in full and leave a substantial balance.[14] It is to be hoped that this minister was "worthy of his hire," which was munificent, as measured by the spirit of his people.

CHURCH BUILDINGS AND SERVICES

"The groves were God's first temples." In pioneer days a grove watered by a cool spring was a common place of worship. A circle was cleared of underbrush and a rude platform erected, or the minister used a stump as his pulpit. The people sat on the ground or on logs.

A hewn log served as the communion table. Camp meetings, which sprang up all over the state after 1800, were held in groves.

Rev. Frederick A. C. Muhlenberg, an outstanding Lutheran, who journeyed to the Shamokin region in 1771, gives this account of an out-of-door service there: "On the 30th of June a great crowd of people, mostly Lutherans, gradually assembled. They all came in their canoes from up and down the Susquehanna. Both the house and the barn were too small. . . . The people would bring some twenty saplings and set them up to afford shade so that they could hold out during the heat. I stood on the platform between two trees, whose shade protected me. The people occupied rails, logs and the greensward in the yard. During the singing and prayer everybody stood up reverently. During the sermon they rested neath the shade of the trees. Methinks I never saw a more solemn occasion."[15]

Many early church services of all denominations were held in homes. For a century after coming to Pennsylvania the Amish had no meeting houses but met in homes; this continues even today to be the custom of House Amish. On the western frontier little neighborhood groups of Presbyterians gathered together in a cabin home as a "praying society". One who had been an elder elsewhere would read the Bible by the light of a smoking pine knot or sputtering tallow dip and lead the little group in singing psalms and hymns of the faith and in prayer. Methodist "class meetings," small groups meeting in homes, were admirably adapted to frontier conditions. These groups became the nuclei of churches.

The first church buildings in the American colonies were similar to but larger than the log cabins of settlers. They were made of round, unhewn logs chinked with clay and had oiled paper windows. The floor was of earth. These houses of worship could be erected by the congregation in one day. Split logs served as benches and a section of a large log as the pulpit. Eventually these crude buildings were replaced by hewn log structures having puncheon floors and small glass windows; and later by more spacious frame, brick and stone edifices.

Funds for erecting these more substantial buildings were raised by subscription, assessment, lottery, or they were built by compulsory labor. In 1784 the Great Bethel Baptist Church resolved, "The members shall work at the meeting house every day that is appointed . . . under penalty of five shillings for neglect."

The large majority of colonial church buildings, like the great cathedrals of Europe, were unheated. It was thought that fire was not appropriate in a church, however necessary it might be at home. The preacher could warm up to his subject, but his audience had to shiver through the long and often tedious sermon. It is recorded that on one very cold Sabbath, "the Sacramental Bread was frozen pretty hard and rattled sadly as broken into the Plates." The chill and dampness of a building that had not been heated throughout the year penetrated to the marrow of the bones. Women and children sometimes carried to church foot-stoves—metal boxes filled with live coals; or hot soapstones. The services, however, were not shortened any because the church was frigid.

Many early churches were sharply divided on the issue of heating the building. Eventually, and only after much hard feeling had been generated and deep-seated convictions violated, those who liked to be comfortable, even while at worship, prevailed over those who thought it sinful to worship in a heated building. Fireplaces began to appear in some churches after 1790 but not until after 1840 were many rural churches heated with stoves.

Union churches were common in rural districts. At first the community schoolhouse was used on successive Sabbaths by different religious groups. Lutheran and Reformed congregations in particular often worshipped alternately in a jointly owned building. In 1794 Cazenove reported, "In the country churches [Northampton County] a Lutheran and a Presbyterian sermon are alternately preached."

As rural churches became stronger and centers of the religious life of country people, family burying grounds on farms were discontinued and burials were made in the church yard, beneath the steeple that pointed upward, symbolically, toward God.

Our rural forefathers of the frontier days would not have been satisfied with twenty minute sermons, nor with church services that lasted only one hour. They were accustomed to sermons of two hours, perhaps longer. There might be two of these lengthy discourses each Sabbath, one in the forenoon, the other in the afternoon, with a variable intermission for lunch. Some religious groups spent most of the Sabbath in and about the church. In 1749 Peter Kalm recorded, "The Quakers in this town [Philadelphia] attend meeting three times on Sunday—from ten to twelve in the morning, at two and finally at six in the evening. Besides, they attend service twice during the week; namely, on Tuesday from ten to twelve and on Thursday at the same time."[16]

In some groups, notably Quakers and German Sectarians, men sat on one side of the room and women on the other. During lengthy sermons, especially on hot days, the heads of even the most devout were prone to nod, until awakened by a vigilant tipstaff or deacon appointed for this purpose.

Prior to 1800 the services of all German churches were conducted in German. About 1810 the question was agitated as to whether English, which was the prevailing language of the state by that time, should be used in church. It was felt by some that use of German tended to retard the growth of German churches by excluding from the services all non-Germans. The change was stubbornly opposed by the conservative element; congregations were split on this issue. In 1815 the Ministerium of German Churches of Pennsylvania resolved, "As our Ministerium is a German-speaking Ministerium it could appoint no pastor who could not speak the German language." After 1826 English began to replace German in the pulpit but the change was not general until long after 1840.

The form of worship generally followed by Quakers and Amish was quite different from that of other religious groups. Peter Kalm describes a Friends Meeting which he attended in 1749:

"When a man comes into the meeting house he does not remove or raise his hat. . . . We waited very quietly from ten o'clock to a quarter after eleven, during which the people gathered and then waited for inspiration of the spirit to speak. Finally, one of the two old men in the front pew arose, removed his hat and began to speak. . . . In their preaching the Quakers have a peculiar mode of expression which is half singing, with a strange cadence and accent, and ending each cadence, as it were, with a full or partial sob . . . . The man's sermon lasted half an hour. Then he sat down and put on his hat.

"After that we sat quietly for a while, looking at each other, until one of the old women in the front pew arose, when the whole congregation stood up and the men removed their hats. The woman turned from the people to the wall and began to read extemporaneously a few prayers with a loud but fearfully sobbing voice. When she was through she sat down and the whole congregation with her. When the clock struck twelve, after a short pause each one got up and went home. It happens, also, that the whole congregation sometimes gathers in the meeting house and sits there silently for two hours."[17]

The Sabbath practice of so-called House Amish has been described by P. E. Gibbons: "On a Sunday morning Amish wagons covered with yellow oil cloth may be seen moving toward the house of that member whose turn it is to have the meeting. Great have been the preparations there beforehand—the whitewashing, the scrubbing, the polishing of tin and brass. Wooden benches and other seats are provided for the meeting folks. . . . In the interior of a Mennist meeting a Quaker-like plainness prevails. The men, with broad-brimmed hats and simple dress, sit on benches on one side of the house, and the women, in plain caps and sun-bonnets, are ranged on the other; while a few gay dresses are worn by the young people who have not yet joined the meeting. The preachers are not paid and are chosen by lot. Of course, young mothers do not stay at home but bring their infants with them.

"When the meeting is over, the congregation remains to dinner. Bean soup was formerly the principal dish, but the farmers of a fat soil no longer confine themselves to so simple a diet. Imagine what a time of social intercourse this must be!"[18]

Except in the silence of Friends' Meetings, singing was an important feature of worship, especially of Germans. In early colonial days singing was wholly congregational. Being by ear, it was likely to be rather uncertain and disjointed at times. There being a great scarcity of hymnals, the minister, a clerk or a deacon "raised the tune" and "lined out" the hymn, two lines at a time. After each lining out the congregation sang it after him. A tuning fork was used to get the pitch. Lining out hymns persisted in many rural churches long after the necessity for it had passed; those who were accustomed to it did not like to change.

Singing by note, which became more general after 1760, roused vigorous protest in some quarters as impious. Some ultra-conservative brethren rose and stalked out of the meeting each Sunday when such singing began. By 1800, however, note singing had replaced "lining out" everywhere except on the frontier. There was much opposition to instrumental music in churches, but by 1860 many rural congregations had melodeons.

The preaching service was practically the only activity of early churches. There were no Missionary Societies, Ladies' Aid Societies, Sunday Schools or church socials. The first Sunday School in America, as now organized, was held in Philadelphia in 1790 by Friends. It was patterned after the English plan and was called the "First Day or Sunday School Society". It was non-sectarian and had paid teachers; expenses were met by subscriptions. In 1816 voluntary teachers were substituted for paid teachers and the several denominations assumed responsibility for conducting Sunday Schools for their own youth. By 1820 they were a vital factor in Protestant Christianity. Sunday School libraries had a far-reaching influence; in most rural communities these were the only circulating libraries.

FAMILY WORSHIP

The Sabbath was a day of family worship as well as church worship. It was observed in the spirit of the Biblical injunction, "Remember the Sabbath day to keep it holy." In his *Frame of Government,* published in 1682, William Penn provided, "Every first day of the week, called the Lord's Day, People shall abstain from their usual and common toil and labours, that they may the better dispose themselves to worship God according to their understanding. . . . to read the Scriptures of Truth at home or frequent such meetings of religious worship abroad as may best suit their respective persuasions."[19]

Until long after 1840, most of Pennsylvania's farmers and their families attended public worship on the Sabbath, abstained from labor except necessary care of livestock and read the Scriptures and other religious books at home. No traveling, visiting or amusements took place on the Sabbath. The same reverent recognition was accorded to other days having special religious significance. "The German farmer of 1790," says David C. Henning, "observed literally the fast days. There came to him *Oashtera, Himmelfertag, Caarh Freitag,* and *Pingstha.* He watched as carefully for Marie to cross the mountain as for an eclipse; indeed, it was claimed that certain persons had actually seen her in her flight."

Scotch-Irish were very strict Sabbatarians. Rising early, they suspended all farm and home activities that were not absolutely necessary on that day, such as shaving, blacking boots and baking; these were done the day before. Much of the Sabbath was spent at church. Afternoon and evening were devoted to reading the Scriptures and religious books and to training the children in the *Shorter Catechism.* John Hamilton, a staunch Presbyterian of Centre County, recalls the Sabbaths of his boyhood: "All secular literature was banished and the Bible, *Confession of Faith, Shorter Catechism,* Rouss' version of the Psalms, the Apostle's Creed, the Ten Commandments, and such books as *Mother's Catechism,* Bunyan's *Pilgrim's Progress,* Pollock's *Course of Time,* Young's *Night-Thoughts,* Fox's *Book of Martyrs* were the only reading permitted."[20] Other spiritual refreshment on Sunday afternoon in Presbyterian homes included Baxter's *Saint's Rest,* Allein's *Alarm* and Watts' *Psalms and Hymns.*

John W. Dinsmore reminiscences on the peaceful Sabbaths of his youth: "Everybody except the very aged and infirm went regularly to church. . . . No matter how rough the weather nor how bad the roads, nor how long the distance, everybody went on the Sabbath day . . . . Looking back now, after sixty years of varied experience have come and gone, how soft, how silent, how sweet and restful those old-time Sabbaths seem! The memory of them has rested like a mellow benediction on all the intervening years. The plow stood still in the furrow; the weary horses fed ankle deep in the pastures . . . cows and oxen, with their great, soft eyes, lay quietly in the shade of oaks and hickories, contentedly chewing the cud; lambs gambolled on the green hillsides. All was so peaceful, so soothing, so sacred. Many grey-headed men and women, now widely separated . . . recall with deep and tender memory . . . the quiet Sabbaths of their childhood."[21]

In most farm homes during those early years the family altar was raised and maintained. In the boyhood of John Hamilton of Centre County, "Reading of the Scriptures and prayer were held daily, at which every member of the family was required to be present." When young folks married one of the first things these founders of a new home did was to buy a family Bible. It occupied the place of honor in the center of the living-room table and was a source of daily spiritual food. Rural people were *Bibel-fest,* as the Germans say; their memories were stored with many passages of Scripture, gleaned from daily reading. On the flyleaf of "The Book" were recorded the vital statistics of the family—births, marriages, deaths. It was the center and soul of the home.

"At best," says Samuel M'Lanahan, "meeting houses were far and services infrequent. Very largely the 'church' was the home. There was calculated and enforced observence of the sabbath. On that day, at least, many a father reproduced his part as portrayed for Scotland by Burns in *The Cotter's Saturday Night* and, priestlike, read the Bible and prayed with his family. The mother heard the catechism, the Scripture verses and the Psalms. . . . The real source of the religious character of the Scotch-Irish race is, under God, to be traced back of the public church to the secluded but primary and potent influence of this home training."[22] Similar testimony could be given about those of other religious faiths.

In early colonial days the churches imposed a very severe and strict discipline on their members. Although their authority extended only to their own members, it helped to create respect for law and right conduct generally. Friends, Lutherans, Presbyterians, and other denominations called offending members before ecclesiastical courts; evidence was presented and the court sat in judgment. Convicted members could not be jailed or otherwise punished, as in civil courts, but they could be denied church fellowship, which was greatly prized. First offenders were merely warned; repetition of the offense usually resulted in exclusion from the church and publication of the facts so as to humiliate the offender and serve as a warning to others.

Quaker rules of conduct were enforced by a committee of the Meeting. Friends were very severe in their judgments; many were "disowned" for what might be considered minor offenses. Those who were slack in attendance were first admonished; if no improvement followed they were excluded from the Meeting. Monthly Meetings were cautioned by the Yearly Meeting to "admonish such as are subject to drowsiness when met on solemn occasions." Friends convicted of lying, cheating, stealing, "frollicking," dancing, playing cards, attending cock fights or horse racing, frequenting inns, quarrelling, swearing, being "in liquor above what was right," vanity in dress and other human failings were separated from the fellowship. Friends guilty of "heresy," bearing arms in war or giving aid to combatants were dealt with summarily.

Other religious groups, particularly German Sectarians, were almost as strict. In 1805 a German congregation in western Pennsylvania adopted these rules of conduct for its members: "Whoever shall work on Sundays or on festal days, if such is unnecessary and not a work of love, or gets drunk, dances or gambles or allows any sinful or wicked company in his house, shall be brought before the preacher and consistory."

Sometimes a charge against a church member back-fired against his accuser. It is recorded, "Brother Morris of the Big Whiteley settlement [western Pennsylvania] bought some 'superfine flower' that he found, upon examination, to be 'common flower,' there being some small specks in it. The seller was investigated by a committee of the Church, which rendered judgment against the accuser because 'It was not fair for a man that used Spectacles to inspect flower, for it made the Specks larger.' "

Church members were expected to bridle their tongues, even under extreme provocation. A usually discreet member who desired to have his older children baptized was charged with having used "unguarded expressions" on one occasion. Being convicted by his church disciplinary committee, it was ordered that his children remain unbaptized until he publicly acknowledged the error of his ways and promised to reform. An extreme case of church discipline was that of a Mr. Neone, a member of a Dunker congregation at Morrison's Cove, Blair County, about 1756. He was attacked by an Indian while working in his mill and killed the Indian in self-defense. For this violation of the noncombatant tenet of his sect he was excluded from the church and never reinstated.

GROPING TOWARD RELIGIOUS TOLERANCE

The amount and degree of religious intolerance in early colonial days, even in Penn's haven for the religiously oppressed, seems hardly credible now. Each sect seems to have had the conviction that it alone was the respository and guardian of "the true religion" and was scornful of all others. Part at least of the tenacity with which they held to their own particular interpretation of the faith was the persecution which they had experienced in Europe. Our forefathers were people of strong religious convictions and not much given to tolerance of the point of view of others.

Few Pennsylvania religionists, however, were as fanatical as Cotton Mather, the celebrated Puritan minister of Massachusetts. The following letter is said to have been written by him:[23]

Sept. 15, 1682.

"Y^e^ Aged and Beloved Mr. John Higginson:

"There be now at sea a ship (for our friend Mr. Easaias Holcroft of London did advise me by y^e^ last week packet that it would sail some time in August) called y^e^ Welcome, with R. Greenaway master, which has aboard an hundred or more of y^e^ heretics and malignants called Quakers, with W. Penne, who is the chief scampe, at y^e^ hedde of them.

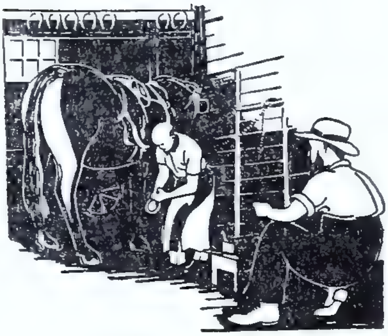
Y^e general court has accordingly given secret orders to Master Malachi Huxett of y^e Brig Porpoise to waylaye y^e said Welcome slylie, as near the coast of Codde as may be, and make captive of y^e said Penne and his ungodly crew, so that y^e Lord may be glorified and not mocked on y^e soyle of this new country with the heathen worship of these people. Much spoyle can be made by selling y^e whole lot to Barbadoes, where slaves fetch good prices in rumme and sugar, and we shall not only do y^e Lord greate service by punishing y^e wicked, but we shall make great gayne for his ministers and people. Master Huxett feels hopeful and I will set down the news he brings when his shippe comes backe.

Yours in the bowels of Christ,
Cotton Mather."

There is considerable doubt as to the validity of this letter; nevertheless it faithfully portrays the attitude of some church people at the time of the founding of the Quaker Commonwealth. It is to the credit of Pennsylvania that the diverse religious groups that settled the colony lived together on the whole, in a reasonable degree of mutual tolerance. This was an important factor in moulding the liberal character of the Commonwealth.

Mennonite meetinghouse built in 1742 near Landisville—the oldest church building in Lancaster County.

XXII



FARMERS AS CITIZENS

DURING the two centuries covered in this survey farmers were the most important element in the body politic. They comprised most of the population, produced most of the wealth and dominated the political life of the province and state. Fluctuations in the economic, political and social status of farmers during this period reflected the ebb and flow of the fortunes of the Commonwealth.

THE FARMER IN POLITICS

Prior to 1840 the farm vote was the deciding factor in Pennsylvania affairs. At the close of the colonial period less than one-twentieth of the people were engaged in non-agricultural pursuits. "Pennsylvania," said Crèvecoeur, "is a colony of farmers. From the land comes most of her wealth—wheat and other grains, livestock, flaxseed, lumber—and from the land, too, comes the spirit of independence of her people."

The Dutch and Swedes who came first to Pennsylvania did not have local government, but with the coming of the English in 1664, a code of laws was promulgated which provided for local self-government. The country was divided into townships and parishes, as in England. The public affairs of each township was administered by eight overseers and a constable elected by the qualified voters. William Penn favored larger units of government—county, rather than township and parish organization. He erected the three original counties of Philadelphia, Chester and Bucks, giving them authority to administer laws, assess taxes, build and maintain highways and bridges, and support the poor. In 1725 the General Assembly provided for the election of County Commissioners and County Assessors. County government was so successful in Pennsylvania, as compared with township government in other colonies, that other states organized thereafter adopted it.

From the beginning of the colony farmers were active in local self-government. Practically all had the right of suffrage. Under the "Great Law" adopted at Chester on December 4, 1682, all freeholders had this right; only slaves, indentured servants and vagrants were without vote.

After 1700, in the affairs of Pennsylvania, political parties began to take form. The Proprietary Party, which included most Quakers, especially well-to-do merchants, supported the policies and program of William Penn. The Church Party, mainly Episcopalians, sought to make Pennsylvania a royal colony and to establish the Church of England as the state church. The Popular Party included many farmers; it was the champion of democracy and a larger measure of self-government. It sought to limit the authority of the proprietary and of the provincial government. Later a two-party alignment prevailed, the Proprietary Party and the Anti-Proprietary Party.

After 1720 Quakers were a minority group in the province but they continued to control the government until 1756. This was made possible by their political alliance with German sectarians, most of whom were as strongly opposed to war and military preparations, even for defense, as were the Friends. Quakers could not have retained control of the provincial government against the steadily increasing opposition party, mainly Scotch-Irish Presbyterians and "Church Germans," without this alliance. Under the leadership of Christopher Sauer, German sectarians went to the polls in a body and kept the Quakers in power.

The frontier, however, revolted. Farmers in central and western counties, mainly Scotch-Irish and Church Germans, chafed under the domination of the Quakers of Philadelphia and the three original counties. In no other colony was the cleavage between the seaboard and interior so sharp. The differences between the two sections were economic and social as well as political. Eastern counties represented social aristocracy and entrenched wealth derived from expanding commerce; western counties represented frontier democracy and moderate means derived almost wholly from agriculture.

The main cause of dissension was the wholly inadequate representation of the West in the General Assembly. In 1756 William Smith, who later served as the first Provost of the College of Philadelphia, wrote: "We have eight counties, and out of thirty-six Members, the three old Counties, where the Quakers are settled, return twenty-six of the Number. The other five Counties, settled with people of many other denominations, especially Presbyterians from the North of Ireland, send only the ten remaining Members among them. This was the policy of the Quakers at the first Erection of the five last Counties, by which means, together with their Artifice among the Germans, the Quakers are always a vast majority in the Assembly, although they are not near one fifth of the People in the Province."[1]

Representation in the General Assembly at that time was:

Philadelphia city	2	Lancaster County	4
Philadelphia County	8	York County	2
Chester County	8	Cumberland County	2
Bucks County	8	Berks County	1
		Northampton County	1
	26		10

Each of the five new counties included a much larger area than at present. This was representation not according to population but on the basis of wealth, and to ensure the perpetuation of existing political power.

The exasperation of farmers, particularly the Scotch-Irish outside the three original counties at this abuse of democratic standards developed into bitterness and eventually into open rebellion. They were taxed to support the central government but received practically no benefit in return. "Taxation without representation is tyrany," proclaimed the patriots in their indictment of the mother country; western farmers were alienated from the East for the same reason. The antagonism to the metropolis of the province which developed among farmers at that time persisted for many decades after the injustice which caused it had been removed.

The back county revolt was aggravated by the pacifist policy of the Quaker party. It refused to give military protection to the frontier during the French and Indian wars of 1755-1758 and 1763. As a result, many pioneers were massacred. The brunt of Indian ferocity was borne by the Scotch-Irish, who predominated on the western frontier, and to a lesser extent by Germans of the central counties; the English, who were mostly in and near Philadelphia, were safe. This experience led German sectarians to transfer their support from the Quakers to the opposition party, which was sparked by the Scotch-Irish. By that time Church Germans—Lutheran and Reformed—were much more numerous than sectarians; these also ranged themselves against Quaker pacifism.

In 1756 the new coalition wrested control of the General Assembly from the Quakers, adopted a declaration of war against the Delawares and Shawnees and offered bounties for their scalps. Most of the Quakers in the Legislature then withdrew; they never regained control of the government thereafter. The abortive invasion of Philadelphia by the "Paxton Boys," in 1764, was a further protest of the agricultural West against the pacifist policy of the commercial East.

With the support of increasing numbers of urban mechanics and tradesmen, back county farmers seized political control of the province. This was done through the Committee of Safety and the Committee of

Correspondence which were set up to insure the effective participation of Pennsylvania in the Revolution. These extra-legal committees superseded the General Assembly as the governing power of the province. Back county farmers dominated the Constitutional Convention which met on July 15, 1776. This convention abolished inequality of representation in the Legislature by providing that it should be based on the number of taxables. It broadened suffrage by providing that all freemen over twenty-one who had resided in the state for one year and who paid taxes were eligible to vote. The new Constitution went into effect on November 28, 1776. The emancipation of farmers from the political domination of Philadelphia was completed.

In the exciting days that preceded the Revolution, the political alliance between Scotch-Irish and Germans was a vital factor in aligning Pennsylvania with other colonies that favored a declaration of independence. A representative of Pennsylvania cast the deciding vote on Lee's resolution, "These united colonies are and of a right ought to be free and independent states." Farmers, particularly Scotch-Irish, constituted most of the Pennsylvania contingent in patriot armies. Most Quakers and German sectarians remained neutral, and the clergy of the Episcopal Church were Tories. Philadelphia capitalists and merchants also were mostly loyalists or tried to remain neutral. Lutheran and Reformed farmers staunchly supported the patriot cause. A letter from Philadelphia to London written in June 1775 says, "It is amazing to see the spirit of the Germans among us. . . . They speak with infinite pleasure of sacrificing their lives and property for the preservation of liberty, which they know full well how to value from its deprivation by despotic princes in Europe."[2]

The strain on many rural communities was severe; in some, more than half the men between sixteen and sixty years of age were in the army and women and children had to do most of the farm work. In Pennsylvania, as in Massachusetts, it was the "embattled farmers" who fired the shot heard round the world. The population of Pennsylvania at the outbreak of the Revolution was ninety-eight per cent rural. The ultimate success of the patriot cause was due not only to the military genius of the leaders but also to the courage, endurance, marksmanship and resourcefulness of soldiers, developed by life on the farm.

After the strenuous and exhausting fight for independence had been won the young republic was beset by financial distress and political confusion. In Pennsylvania, farmers were still in the saddle, politically. They were the strongest influence behind the Continental Congress and the adoption of the Articles of Confederation. After these had been demonstrated to be impractical, the merchant-capitalist class dominated the drafting of the Federal Constitution in 1787. It was thought by many that this document was so drawn as to benefit this class more than farmers, who comprised over nine-tenths of the population. Hence most of the sentiment in Pennsylvania against the adoption of the Constitution came from farmers. However, Pennsylvania was the second state to ratify the Constitution, in December 1787.

Two political parties then developed, primarily on class lines. The Federalist party comprised merchant-capitalists, the remnant of the Tories (after the Revolution thousands of Tories emigrated to England and Canada), and supporters of the Hamilton point of view that a strong central government is desirable. They were mainly the former colonial aristocracy and represented the conservative property interests of the Atlantic seaboard. Members of this party were designated as Whigs. The Democratic-Republican party comprised mainly the so-called "middle class"—farmers, mechanics, small shop-keepers. It stood for "states' rights" and the largest practicable measure of local self-government. Members of this party were designated as Democrats.

Most Pennsylvania farmers were Democrats. In 1800 they helped to elect Thomas Jefferson as President. Although an aristocratic southern planter he staunchly supported the interests of small farmers. Madison, Monroe, Jackson and Van Buren, who succeeded him, also represented the farmer-planter class and commanded the support of rural Pennsylvania. The agrarian party retained control of both the national and the state governments until after 1840.

Political contests between the Whigs and the Democrats engrossed the thought and time of citizens to a very high degree. They were conducted with great bitterness and personal vindictiveness. In 1804 John Thaw visited Pittsburgh, then a sprawling country town, and reported, "The inhabitants are so much engrossed with political discussions that those of opposite sentiments can hardly think or speak well of each other." In the absence of the railroad, telephone and telegraph, more than a month elapsed after an election before the results of a state contest were known in rural districts, and several months in national elections. The outcome of a November presidential election might not be known with certainty until just before inauguration day, March 4.

Politics was exclusively a male function. Suffrage was denied to women because it was considered to be beyond the supposedly limited capacity of the female mind to grasp, and inconsistent with the "delicacy" that, it was thought, should characterize these ethereal creatures. The first convention of women for the promotion of female suffrage was held in 1848.

Politically-minded farmers dominated the Pennsylvania General Assembly until after 1840. The occupations of members of the House in 1834 were: farmers, 55; lawyers, 15; merchants, 4; miscellaneous, 26.[3] The occupations of those elected to serve in the state Constitutional Convention of 1837 were: farmers, 51; lawyers, 41; doctors, 12; merchants, 9; miscellaneous, 23. Even so, the House had no committee on agriculture until 1818 and the Senate not until 1823; and there was a dearth of laws for the improvement and protection of agriculture, the first industry of the state.

Farmers continued to distrust the power of Philadelphia in legislative matters. They resented, also, the great inconvenience and expense of traveling to the extreme southeastern corner of the state to attend sessions of the Legislature. They were chiefly responsible for the removal of the state capital to Lancaster in November, 1799 and finally to Harrisburg in February, 1810.

Before the Revolution, and for a number of years thereafter, public offices were held almost exclusively by English and Scotch-Irish. The political activities of Germans were confined to local issues and to the support of the ruling Quaker party in the General Assembly. A considerable number, especially Mennonites, Dunkers and Moravians, refused to hold public office or even to vote. After independence was achieved and an agrarian party developed, Germans began to be more prominent in local, state and national politics and became a powerful factor in elections.

The uprising of Scotch-Irish farmers in western Pennsylvania in 1794, known as the "Whiskey Rebellion," was followed by an insurrection among German farmers in eastern counties, known as "Fries' Rebellion". In 1799 war between the United States and France seemed imminent. A special tax on land and houses was levied by the Federal Government to defray the cost of military preparations. The value of a house for assessment purposes was determined, curiously enough, by the number and size of its windows.

Many German farmers were strongly opposed to being taxed to support preparations for war; they also resented this tax because it was imposed by the hated Federalists. The opposition was strongest in Lehigh, Northampton, Berks and Bucks counties. John Fries of Bucks County was leader of the rebellion. When the Federal marshal arrested and jailed objectors in Lehigh County, Fries and his followers marched to Bethlehem and freed them. For this act of open defiance of the Federal Government Fries and many others were imprisoned. Both the Whiskey Rebellion of the Scotch-Irish and Fries' Rebellion of the Germans intensified their opposition to the Federalist party and solidified their support of the Republican-Democratic party.

SOCIAL STANDING

Even in early colonial days when ninety-eight per cent or more of the population were farmers, there was little real democracy. Old World class distinctions were carried to Penn's "Holy Experiment";

from the beginning, colonial society was stratified in social layers. The gradations downward were: "gentlemen"—wealthy merchants, office-holders; professional men—ministers, lawyers; farmers, shop-keepers and mechanics; free laborers, indentured servants, and negro slaves. A great gulf separated the "upper class," an aristocracy based on wealth and position, from the much more numerous "middle class" and "lower class." Only clergymen, because of their education and moral leadership, were admitted to close association with the celestial few. On the stern testing ground of the frontier, however, there was real democracy. This was one reason for the antagonism that developed between the poor and democratic West and the rich and class-conscious East.

Except for the few "gentlemen farmers"—to whom agriculture was an absorbing avocation—farmers were assigned to the middle class. Farms were small and were operated almost entirely by the farmers themselves, with the aid of their families; there were few great plantations and few landed gentry. Ownership of a farm, however small, entitled farmers to a niche in the social order a little above that accorded to laborers, indentured servants and slaves. This distinction was derived, in part, from the provision in early colonial days that only freeholders could vote. The meager educational opportunities afforded to rural people also was a factor in fixing their social standing.

Many immigrants, especially Germans, had been peasant or middle class farmers in Europe; this conditioned them to be satisfied, for a time, with that social status here. For many years farmers wore leather aprons, even when going to town; this distinctive garb at once distinguished them as tillers of the soil, to be addressed, patronizingly, by gentlemen as "My good man". But conditions of farming in Pennsylvania were quite different from those in Europe. Individual ownership of land, scattered farms and comparative freedom from the dictates of government soon developed a spirit of independence, self-reliance and social uplook. Soon the peasant farmer of Europe became the independent farmer and substantial citizen of Pennsylvania.

A view of the relative social standing of working farmers and gentlemen farmers in early colonial days is given by an observant European visitor:

"There are some country gentlemen in Pennsylvania who live on their estates in a genteel and expensive manner, but their number is small. . . . In general, the province is inhabitated by small freeholders who live upon a par with great farmers in England; and many little ones who have the necessities of life and nothing more. . . . The most considerable of the freeholders that do not, however, rank with gentlemen, are a set of very sensible, intelligent and hospitable people. . . . The method of living in Pennsylvania in country gentlemen's families is nearly like that of England; the only business is to ride about the plantation now and then, to see that the overseers are attentive to it; all the rest of the time is filled up with entertaining themselves."

Social progress was relatively slow. The comparatively low social status of working farmers continued for nearly two decades after the Revolution. It reflected the prevailing economic distress of agriculture. Beginning about 1800, however, the "New Agriculture" transformed farming, especially on depleted soils near Philadelphia, from an enterprise of very meager returns to one that compared favorably with other business ventures. The forward surge was also stimulated by rapidly expanding markets at home and abroad. The New Agriculture was based on the more general use of lime, crop rotations, the production of more red clover and grass and keeping more livestock. It revolutionized the social as well as the economic status of Pennsylvania farmers.

During the period from 1800 to 1840 farmers were prosperous as never before and their position in the social order was enhanced accordingly. In 1794, when the New Agriculture was just getting under way, Thomas Cooper of Philadelphia wrote: "Nor is the term 'farmer' synonymous with the same word in England. With you it means a tenant, holding of some lord, paying much in rent and much in tythes, and much in taxes; an inferior rank in life occupied by persons of inferior manners and education. In America a farmer is a land-owner, paying no rent, no tythes and few taxes, equal in rank to any other rank in the state, having a voice in the appointment of his legislators and a fair chance, if he deserves it, of becoming one himself. In fact, nine tenths of the legislators are farmers."[4]

The rise of farmers in the social scale during the period 1800-1840 was due not only to their much stronger economic position but also to political forces that were at work in the young republic. New political winds were blowing. With the election of Thomas Jefferson as President in 1800, "the rise of the common man" was well under way. Gentlemen began to discard silver-buckled knee breeches and donned long pants. Class distinctions became less corroding. Farming became an honored vocation. Wealthy merchants vied with one another in the production of superior livestock. The ambition of men of all classes was to have at least one foot on the soil.

The high esteem in which agriculture was held during the first half of the nineteenth century was noted by an English visitor in 1838: "Nothing was more evident to the foreign traveler than the general esteem in which the farmer was held and the important part he played in public life. He represented the most influential class of society; and unless he had bought rashly and was 'land poor' his condition was one of substantial comfort. . . . The possession of land is the aim of all action generally speaking. . . . An artisan works that he may enable his son to be a land-owner."[5]

Thus, within a half century, the social status of farmers was greatly and permanently enhanced. They became, as Fourth of July orators constantly assured them, "the back-bone of the nation," and in more ways than in the production of wealth.

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The year 1840 may be taken as not only marking the end of the period when farming in Pennsylvania was predominantly of the subsistence type, but also the close of the long period when agriculture dominated the economy of the state. In 1840 farming still was the occupation of sixty per cent of the people, but within a few years this proportion was reversed. Farmers still had a major voice in public affairs, but lawyers soon took the lead. Count the farmers in the General Assembly today!

After 1840 Pennsylvania ceased to be the "bread basket of America". The era of specialized farming for local markets had begun. The dairy cow, not the wheat shock, became the cornerstone of Pennsylvania agriculture. The Pennsylvania farmer was to meet constantly increasing competition, first from the West, then from the world. His manual labor was to be lightened by power machinery. He was to be the beneficiary of remarkable developments in the application of science to farming. He was to hear the roar of trucks and the whirr of planes. But that is another story.

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